

# AVIATION WEEK

A MCGRAW-HILL PUBLICATION

SEPT. 20, 1948



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First ship to break the sonic barrier — Bell Aircraft Corporation's rocket-propelled X-1 is equipped with Goodyear tires, tubes, wheels and brakes. Designed to fly at a top speed of 1700 m.p.h. under the full 6,000-pound thrust of its four-unit rocket engine, the X-1 has the strongest airframe ever built.

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### AIRCRAFT DIVISION

4140 South Boyle Ave.  
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# AVIATION WEEK

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AVIATION WEEK, September 29, 1948

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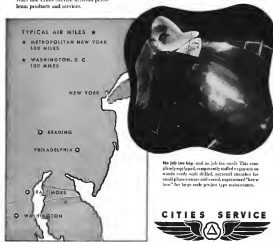
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Clipper Seals are made in both split and endless types and are available for shafts up to 60" in diameter. They are recommended for sealing against oil, grease, water, air, dirt and coolants in operating temperatures up to 450° F.

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## NEWS DIGEST

### DOMESTIC

Price increases in the 1948 Ecoupe Model E to \$1790 (Snyder Revealed, Mid, Low) \$1590 has been announced by Snyder Aviation, Inc., effective Sept. 21.

An Illinois state advisory committee has presented plans to Governor Green proposing a \$300,000,000 central air, rail and highway terminal for Chicago. The terminal would be built near Joliet, Ill., about 21 miles southwest of the loop.

CAR has instituted an investigation at TWA's complaint that Seaboard & Western Airlines, New York, has been operating cargo and passenger flights to foreign ports in violation of the Civil Aeronautics Act.

Gen. James D. Clay promised that the 76th airlift will be expanded during the winter through the use of many planes and utilization of new runways now being built. Five Fairchild C62 Packet transports have already joined "Operation Vittles".

### FINANCIAL

Boeing Aviation Corp. reports net income for nine months ended June 30 of \$7,009,400. Profit for third quarter alone amounted to \$1,837,591.

Lockheed Aircraft Corp. declared dividend of 10 cents a share payable Oct. 1. Dividends of this company were made July 2, bringing dividends this year to 51, as against none last year.

Sperry Corp. and its domestic subsidiaries report net income of \$4,134,000 after taxes for September 1948, equivalent to \$2.11 per share. Income for the same period in 1947 was \$3,578,494 or \$1.76 per share. Unpaid dividend at July 31, 1948, were approximately \$140,000,000 compared to \$100,000,000 at the same time last year and \$201,000,000 at the end of 1947. Working capital June 30, 1948, amounted to \$33,394,642. Semi-annual dividend of \$1.00 per share was paid on July 9. Two dividends in 1947 were 75 cents each.

### FOREIGN

British South American Airlines has increased its schedules between Nassau and Miami from three-week to eight-a-week. No Sunday schedules are flown but twice-daily schedules are in effect on Monday and Friday.

Remco's Cooperative Administration has authorized the Netherlands to spend \$5,000,000 for the purchase of seven Douglas DC-6 transports for JLM.

## INDUSTRY OBSERVER

►Cordell McDowell test pilot Ed Shook with seeing that company's XF-45, experimental jet-powered fighter designed for use with General's B-36. Initial XF-45 flight tests were made at Muroc from a specially equipped Boeing B-29. On the first attempt at engine receipt, rough air triggered Shook's ejection at 23,000 ft. The B-29 rescued the XF-45 escape machine the Phantom, Shook was landed on the hard by the troops which also checked off his crash helmet and oxygen mask. Refusing to bail out, Shook passed the oxygen hose in his mouth and then maneuvered the parasite to an emergency landing as the B-29 descended. The parasite, which carried an emergency landing sled but no landing gear, stalled at about 175 mph. Only design features in landing was a tandem wing tip and a bent lower vertical fin.

►Republic's XR-42 recently completed a 2700-mile transcontinental photo mission averaging 351 mph, at 40,000 ft. Flown by a USAF crew, the first engine photo tank took off from Mather and circled for 48 hours in over the Pacific before beginning its photo run in the California coast near Santa Barbara and ending over New York City. The XR-42 landed at Mitchell Field after a total of eight hours in the air.

►McDowell's surprising XF-45, a USAF penetration fighter, is undergoing flight tests at Muroc. This experimental model is powered with two Westinghouse J40 jet engines located in the plane's belly. The XF-45 is expected to join the North American F-86A in the 700-mph class.

►British are working on replacing versions of their Vulcan Supermarine Attacker and the new Hawker N7/46, both better than 600 mph. Lightnings in their present straight wing version.

►Nashua's BR-49 flying wing bomber, now being tested for production at General Electric, will carry a large photographic equipment for long-range mapping missions. The high-speed characteristics of the large, eight-jet craft (360-mph, top speed, 4000-gps, rate-of-climb) make it ideal for photo-reconnaissance missions.

►Air Force has revealed that lack of information regarding military requirements for electronic computer systems is jeopardizing all-weather air craft design. Inability of helicopters to perform continuously under conditions for which all-weather fighters are being designed seriously threatens the entire program. AIA Aeronautics Research and Technical Committee has initiated a study of electronic systems.

►CAA has at last taken complete of airline consolidation on airline detection equipment and has initiated a large component for test program, in separate phases, at the U. S. Bureau of Standards and the CAA. Lockheed test series. Preliminary results on evaluation tests of engine detection equipment, which have been conducted by the airline, will be submitted to CAA for consideration in standardizing the New 1 detection test suite detection installations.

►Substantial increase in the 500 mph top speed of the North American B-45 fighter tactical bomber is under way with the installation of the General Electric J47 turbojet engine in the B-45C model. The new engine has a 1000-hp rating compared to the 400-hp thrust rating of the Allison J45 installed in the B-45A production model.

►Curtis-Wright engine division has delivered first of 16 overhaul and modified R4D C-47 transport engines under Navy contract. It is significant that in N. A. S. Princeton, N. J. 2 late arrival at San Diego and No. 1 late arrival at Columbus, Airplane division is working operations on its contract for R4D (Douglas DC-3) overhaul, having delivered 64 of a total of 74 being processed.

►Lockheed has completed the overhaul of the FTV-4 Neptune patrol plane powered by two Wright-3200 compound engines. Model FTV-4 production has been double in the last few weeks, requiring large one and overhaul to three days per week in accordance with accelerated Navy production schedule.

►First Navy unit of Lockheed Shooting Star, quadron CF-6A, is now being formed at North Island Naval Air Station, San Diego, Calif., under the command of Cmdr E. J. Fuchs. Navy received personnel are attending classes in Allison J33 turbojet engine maintenance at Indianapolis. The first of the Lockheed F-80 fighter-bombers, designed T-01, by the Navy, will be delivered shortly.





## Succulent Supper... *En Route*

➤ Early this morning this lobster was twenty-fathoms under the Atlantic. Tonight it will provide the main dish at the Brown Palace Hotel in Denver... all because of modern high-speed air cargo transport.

➤ Air cargo delivers food, medicine, clothing... needed supplies at every kind... in hours instead of days. Film, mail, fast passenger transportation, are vital services the airlines offer American business.

➤ Plane loads of goods or men are time are paid for... and Sperry equipment helps airlines stay on schedule regardless of weather or visibility... helps on time the schedule reliability so important to air cargo carriers.

➤ Today, many airlines equip their cargo... as they do their passenger transports... with... the Sperry A-12 Gyroscope® for smooth, level flight... the Automatic Approach Control to guide valuable cargo safely down the runway... the Gyrocompass® for accurate information on position and direction.

➤ These and other well-known Sperry products are designed for long

hours of trouble-free service... are designed to enable airlines to operate their cargo and passenger services more efficiently and more economically... with some profit. For example, the new Engine Analyzer checks engine performance during flight and prevents costly repairs on the ground.

➤ Meanwhile, Sperry research and engineering employ new, better ways for moving men and goods by air.

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## Manufacturers Warned to Step Up Output

### USAF gets release of funds for 500 more planes; even greater production needed.

By Robert Hott

The aircraft industry left increased pressure for greater production last week.

Following were significant developments:

- U.S. Air Force was well along on authorizing an additional \$198,000,000 of its fiscal 1949 aircraft procurement funds for purchase of about 560 new planes in addition to the 2251 now on order.
- Top Pentagon Officials privately warned the aircraft industry to step up production and wipe out current deficiencies in military plane delivery schedules.
- Plans to begin production on the Boeing B-47, a major surprise bomber currently the fastest USAF bomber flying, was accelerated to put the plane in the fiscal 1949 procurement program.
- Preliminary discussion of the fiscal 1952 budget indicated increased appropriations for the USAF and a sizable boost in aircraft procurement funds in the second year-end peak of fiscal 1949.

USAF has already received approval from Defense Secretary Forrestal for allocation of \$103,000,000 in additional plane contracts. Another Presidential approval of this fund was expected early next week. Another request to spend an additional \$99,000,000 (the balance of unexpended fiscal 1949 procurement funds) was coming through the new channels for approval requested by the Armed Services Procurement Act of 1945.

The \$103,000,000 will buy:

- One Lockheed F-80C fighter plane (Lockheed Aircraft Corp. This brings the Lockheed F-80C backlog (including jet trainers) to about 600 planes.
- One Lockheed F-84F jet fighter from Republic Aircraft Co., Republic has completed orders for 1130 F-84s (including the 100-100 of these have been delivered).
- Thirteen B-50C five engine bombers from Boeing Airplane Co. Total of 35 B-50Cs are now on order. Work



Lockheed F-80Cs are shown undergoing final inspection at the company's Burbank, Calif., plant before delivery to the Air Force. The USAF has ordered 477 of this model, powered with an Allison J35-35 engine. Delivering 6000 lb. more thrust.

on prototype YB-50C equipped with Pratt & Whitney V2D engines in self advanced. Due to expert differences between the B-50C and earlier B-29 types the production model designation will be changed soon to B-47. Boeing also has an Air Force export contract for the XB-55, a four engine turbojet bomber.

USAF's request for the \$103,000,000 was the first to go through the new channels requested by law for aircraft procurement funds. Specific requests for use of procurement funds authorized by Congress by either the USAF or Navy now go to Defense Secretary Forrestal's office where they are routed to the Research and Development Board and the Materials Board.

• Moderately Detailed—Research and Development Board studies the proposed allocations to determine whether the equipment to be purchased is the latest and best available. After receiving technical approval (RDB) passes the program on to the Materials Board which studies the aircraft industry's ability to handle the required production. After

Materials Board approves the proposal goes to Secretary of Defense for certification to the President for the equipment involved in necessary for the security of the country. Final approval comes from the President through the Budget Bureau.

The new procedure is necessary because the 1945 procurement act specified that the President must submit a quarterly report to Congress on progress of the aircraft procurement program and must certify that the equipment so ordered is required for national defense. Since presentation of a quarterly report on aircraft already in hand would put the President in the position of merely rubber-stamping unscrutinized facts, the new procedure requires Presidential endorsement of all aircraft contracts before they are placed by the Air Force and Navy. Navy quarterly report will cover expenditures to Sept. 30.

• **Stark Move Funds—Allocation of the remaining \$95,000,000 of USAF procurement funds for fiscal 1949 is still under study by the Research and Development Board. Allocation is expected to be returned to Secretary Forrestal in about two weeks for a final decision. With the money the USAF wants to begin production of the Boeing B-47. Aviation Week, April 17 and June 17, 1948.**

An initial order of \$48,000,000 for 10 B-47s will be placed to get the production line at Boeing No. 2 plant at Wichita, Kan., started. Production work on the B-47 production line has been under way at Wichita for some time.

Air Force Secretary W. Stuart Symington had previously indicated the B-47 would not enter the production picture until fiscal 1950.

Other items to come out of the \$96,000,000 would include \$25,000,000 for production of guided missiles and \$48,000,000 for about 300 additional transport helicopters and utility planes. USAF has already allocated about \$48,000,000 for purchase of tooling required for high-rebate production and has \$344,000,000 still to be spent for a similar package.

• **Navy Plans—Navy still has approximately \$100,000,000 in unallocated funds for aircraft procurements. Navy's request for additional expenditures is expected in Secretary Forrestal's office.**

## From High-Speed Bombers to High-Speed Transports MARTIN LEADS THE WAY INTO THE FUTURE!



**TODAY:** The Martin 304-B is an military transport can carry 51 military personnel or more than 12,000 pounds of military equipment twice the capacity of helicopters equipped used in World War II and still in service. And the 304-B cruises at speeds 100 m.p.h. faster than the World War II planes it replaces... yet operates from the same short runways, small airports.

# Tomorrow

Martin engineers are constantly at work harnessing higher and higher speeds in the transport and combat needs of our Military Services. In the days to come, look to Martin for rotary wing aircraft and other suitably developing fields.

The Glenn L. Martin Co., Baltimore 3, Md.

# Martin

## AIRCRAFT

Builders of "Dependable" Aircraft Since 1919

**YESTERDAY:** The famous Martin B-30 bomber, faster by 100 m.p.h. than any other bomber of its day and capable than most gun-ship, made steadily earned the world's military aircraft was the 1932 Collier Trophy for Glenn L. Martin.

"STAR BAY," Bruce Forsyth's new book, is the thrilling story of the battle men who have and captured Martin. It's the story of the battle men who have and captured Martin. It's the story of the battle men who have and captured Martin.

next week with that action due about Oct. 1.

Warning that the aircraft industry must meet its delivery schedules was sounded off only this morning in a blunt "off-the-record" speech by Air Force Secretary Symington to the Aircraft Industries Association held at Governors at Williamsburg, Va. The speech was later printed in the Congressional Record, Stoen Postings looking as the storm from two facts:

1. That the rapidly deteriorating institutional situation requires a well-earned Air Force to bring rather than on the production line.

2. That it will be difficult to sell the 81st Congress on the second step in the 1954 USAP expansion program unless the industry industry demonstrates that it can handle efficiently orders at such as the books.

Industry Reaction—Post industry reaction to the pressure for maintaining delivery schedules came at Congress's First Worth plant where 7000 workers went on a 35-hour day and in the week to convert B-36 deliveries from falling behind schedule.

Postponement budget estimates for fiscal 1952, the first year the USAP will select a separate budget, indicates a \$15,000,000,000 national defense budget with the USAP getting about \$6,000,000,000. Proposed aircraft procurement funds are about double the current \$3,817,000,000 allocation for new planes.

### Navy Blimp Contract

A Navy design contract for the largest non rigid sailing ever built, awarded to Goodyear Aircraft Corp., Akron, Ohio, promises to be followed by a contract to construct for at least a prototype of the new type N-100.

Specifications call for a patrol ship with 325,000 cu ft capacity, internal gas bag 324 ft long, 71 ft wide and 92 ft high. At 57 ft double-deck controls under the envelope, would house crew of 16 officers and men, with additional and one living quarters on the lower deck away from engines and controls. A galley and crew equipped with electric crane and refrigerator are included.

The Gas Bag-type envelope would have nearly twice the capacity of the K-type blimps used in anti-submarine patrol during World War II and now widely used occasionally after the war for purposes, to display electric signs. The model for the N-100 nearly 100,000 cu ft gas capacity was the Navy's M-1 Mighty Mike, believed the largest non-rigid airship built previously.

The Mighty Mike set a world record for continuous flight without refueling two years ago, at Lakehurst, N. J. in an cruise which lasted 170 hr 17 min and 17 sec.



## British DH-108 Hits Sonic Speed

U. S. observers emphasize difference between craft's dive performance and level flight mark of F-86A.

British press reports of supersonic speed attained in a dive by the DH-108 said a solid supersonic test with the U. S., where the F-86A has exceeded the speed of sound in level flight.

John Derry, 27-year-old test pilot, reached an indicated Mach number 1.8 in a dive from 49,300 ft on the supersonic declassified DH-108 research plane.

The Machmeter reading was reached when the speed of sound is in the vicinity of 55,000 ft. represents about 667 mph, under standard conditions (—56.5 deg F.).

►No Mark for X-1—The performance is no match for the 700 mph level flight at between 35-40,000 ft of the supersonic North American F-86A standard production Air Force fighter with full armament, as the Mach number 1.4 and 1100 mph accomplishment of the straight wing Bell X-1 rocket research airplane.

Flight begun as a routine test at high speed landing characteristics the plane is designed for the Ministry of Supply. Derry began his dive at 49,300 ft over Windsor, 16 miles west of London and began his pullout at about 13,000 ft immediately after achieving the sonic phenomenon. The dive took about one minute and the flight lasted about 15 minutes.

►Pioneer Wakefield—Derry wore a "pressure suit" and oxygen tank, since the cabin is not pressurized. He reached immediately after the flight that he had experienced no unpleasant physical sensations. He did, however, reveal that the flight controls grew progressively "heavier" requiring special effort as he put to rest from the dive into level flight. He did not experience any loss of control or buffeting during the flight.

Derry revealed that he does not believe the airplane capable of sustained level flight. It is powered by a declassified Gloster Meteor engine actually rated at 3700 hp, static thrust but is especially modified to provide greater thrust for the tests. The airplane is the third in a series, the second of which took the life of Geoffrey de Havilland in September, 1946.

►New Controls—Derry's flight report may shed additional light on the cause of this tragedy since the second airplane did not have the power boosted controls fitted to the third airplane. The lack of boost plus Derry's report of high stick forces point towards probable cause of the crash.

The DH-108 was originally built to test the basic design of the new wing, improved declassified DH-108 (Crest) transport, showing completion and checked by the test program. The first DH-108 was assembled from a DH-108 Vampires jet fighter landing and power plant plus swept wing panels and a high vertical swept tail.

►Second Look—It was a low-speed model used to determine stability and control of the layout. The second airplane was lost in the Thames south. The first airplane was strengthened and tested and checked by the test program. The second DH-108 was assembled from a DH-108 Vampires jet fighter landing and power plant plus swept wing panels and a high vertical swept tail.

The Ministry of Supply announced that the flight would have no effect on an aircraft program through the transonic region.



HAWKER'S New-powered fighters, N 5/46, Navy version of the RAF P. 1040.

## Britain Reveals New Plane Types

Aircraft manufacturers' annual exhibition shows 40 models for the first time, including latest jet fighter.

(McGraw-Hill World News)

**FARNBOROUGH, England**—Expos for tomorrow's planes, it isn't the target of things to come, were on parade for the world's buyers here this week as Britain's aircraft industry in conjunction with the Ministry of Supply, pulled up the blinds on the largest window display of planes and power plants ever intended.

The showcase, the ninth annual exhibition and flying display of the Society at British Aircraft Corporation.

A crowd attendance of some 1900 trade representatives from 61 countries, including Americans, watched Britain's secret plans put more than 50 of the latest British-built fighters, bombers, training planes and transports through their paces.

They also introduced carefully the same planes and some 20-odd other new types parked in the static display. More than 40 planes were being exhibited publicly for the first time, although details of a good many of them have been disclosed from time to time.

British sales of aircraft and engines to other countries, now a major contributor to the nation's export drive, will get an added boost from the show. This year's record level—£35 million for the first seven months—is already well ahead of last year's £24 million total, and what is of equal importance, nearly one-third of current aircraft exports are to Commonwealth countries. Before the

war (1938) exports totaled a total £55 million.

This year for the first time the exhibition was open to the public—on Saturday and Sunday, Sept. 11 and 12, after four days when admission was limited to the trade.

Progress in aircraft design was set so strikingly evident as the exhibit that one, largely because the truly advanced design projects are still under security wraps.

► **New Turbojet**—The Avon Rolls-Royce's new small free turbine engine was on show. It was displayed in a Star bi-powered, low-altitude, with two Avon Bristol in the outboard nacelles.

► **Alljet**—*Admiral-AVRO's* Tutor VIII, powered by four Rolls-Royce

New turbojets placed in that machine's four engines during the war, made an first flight Sept. 5, just the day before the show opened.

The Tutor VIII, the world's first four-jet transport plane, the Vickers Armstrong's Viking powered by two Nees (which flew some time ago and was on exhibit), a partly an experimental project for the Ministry of Supply. Both craft are greatly overpowered for the strength of their airframes but they are useful in conducting research into the problems of transport planes intended to fly at high altitudes.

► **Jet Fighters**—The new RAF and Naval fighters, the P.1040 and N.548 (two versions of the same machine), powered by a single Rolls-Royce

Nene with a novel divided air inlet and exhaust outlet, gave what was probably the closest flying exhibition.

Sunderland's SRA.1 flying boat fighters, which are powered by two Metro-Vick multi-fuel turbojets, also was on show. It showed a maneuverability and a performance at well over 500 mph that belied its highly boxy construction.

► **Turbojet**—*Armstrong-Whitworth's* A.W. 52 showed advanced how Britain is tackling the problems of inflow and boundary-layer control on very thin, swept-back wings. An earlier version, powered by two Nees, has been flying for some months; the second version, just completed, is fitted with two Rolls-Royce Trenton turbojets, which are smaller in diameter and permit so small inlet-to-exit ratio.

De Havilland's Goblin-powered swept-back wing D.H. 108 was not present when the show opened, being delayed at Hatfield for high-speed trials, but was shown to the public at the close of the show.

► **Turboprop**—*De Havilland's* Valiant Armstrong's Viscount powered by four Rolls-Royce Darts, had completed many as the world's first radial-turboprop aircraft, as Armstrong-Whitworth's Apollo jet raised some curiosity in time for the show. This is the first evolution of the Dart, which has been brought along slowly and is still in the "experimental" stage, particularly as to the selection of cooling problems.

To enable visitors to make the transition to high-speed jet-powered flight, Britain has left the door for an intermediate machine, and two different segments to the specification were on show. Handley-Page's Herald the first to fly, and Avro's Alderley. Both are powered with Armstrong-Siddeley's Maiba

turboprop. Some of the bloom was shown all these projects by the presence of variants of each, both powered by Rolls-Royce Merlin piston-engines. And it is these latter variants that have been given the initial production orders. It is light (perhaps because of the cautious handling given the turboprops) there was little to choose between piston prop and turboprop types, except for greater performance of the turboprop.

► **Conquest Engines**—Coming along rapidly as most powerful turboprop design which were on exhibit the Napier Naud, with 1900-hp turboprops; the Bristol Thetis, with 2200 hp, and Pegasus, with 3100 hp, and the Armstrong-Siddeley Pythons, with 3670 hp.

The Naud has been constructed in a replacement power plant for the Avro Anson short-range transport; the Thetis is already designated for the Handley-Page Hercules V, and the Pegasus is scheduled to power both the six-engine prototype of the giant Bristol Britannia and all of the Saunders-Roe SR45 flying boats.

The Naud and Thetis were flown as part of the crowd at the exhibit in their respective flying vehicles (the Naud in a Lanchester, and the two outboard nacelles of another Lanchester), the Pythons also installed in the outboard nacelles of a Lanchester, but in completely redesigned structure built at the factory and was not on hand at Farnborough.

► **Other Types**—Among other types: Handley-Page Hermes IV, medium-range civil transport, powered with four Bristol Hercules VI radial piston engines and with a maximum cabin for a maximum of 67 passengers.

Major change from the Hermes II prototype, shown last year, was the incorporation of a hydraulic landing gear.

► **Genius showed two new turboprops** the "Air Horse", designed to carry 34 passengers in 3-4 tons of cargo, and with their rotor driven through a central power line by a single Rolls-Royce Merlin, and a very large two-plane Slaves, powered by a 160 hp. Hercules engine.

► **Avro contributed the only six conventional lightplane design**, the A.1945, as well as observation post plane, and the Avro 7 dual-engine.

AA, UAL Follow Suit

Competitive passenger lines American Airlines and United Air Lines, passenger firms together last week, United followed American's lead in announcing the 10 percent premium on DC-6 fares, while American fell in line with other carriers by stepping a 5 percent discount on round-trip, inclusive air flights made under the timely fare plan.

AA's service family plus parents wives and children under 21 accompanied by accompanying passengers to travel at half fare if their flight starts between Monday and Wednesday.



SLAVES observation post plane, A.1945.



AVRO's Tutor VIII, four-jet transport.



Gervais three-engine Air Horse.



HANDLEY PAGE Hermes IV.





Photo shows how the Sperry Zero Reader looks to a pilot. The instrument panel grouping has the Zero Reader Indicator as the top row meter with the ILS course pointer indicator on the left and the heading indicator for the Zero Reader on the right. Second row has standard altimeter

powered for altitude control, flight indicator and air speed dial. Bottom row has rate of climb indicator, bank and turn indicator and control switch for Zero Reader. Top row only Zero Reader Indicator in flight can operate while drag meter (aircraft instrument).

## New Flight Indicator Introduced

Sperry develops Zero Reader to make instrument flying simpler and ILS approaches more accurate.

A new flight instrument designed to simplify flying under instrument conditions and improve accuracy of ILS approaches has been announced by Sperry Gyroscope Corp.

Called the Zero Reader, the instrument is a cross pointer cockpit indicator which correlates altitude, altitude and heading information for an aircraft in flight. Result is that when the desired flight path is being flown a cross-pointer is shown on read-out.

► **Ready for Production**—The Zero Reader has been under development by Sperry for about eight years. Recently a development model was flown in the Air Transport Association's research plane Beta on a tour during which chief pilot of major airlines and Civil Aeronautics Administration officials flew the Zero Reader on ILS approaches and during cross-country

navigation flight. Sperry is now completing production engineering on the instrument with initial price scheduled for about \$4000.

The difference between the Zero Reader and standard ILS course pointer indicator is the addition of rate control. Whether flying a pre-selected heading cross country or using an ILS system for an approach to landing, the Zero Reader automatically provides the proper rate of correction to bring the plane out on the desired heading without overshooting.

► **Safe Pilot**—Another variation from conventional flight instruments is that the Zero Reader does not require interpretation by the pilot. It tells the pilot whether to fly right or left and up or down rather than telling him the attitude of the aircraft and leaving interpretation of how to fly up to him.

The Zero Reader consists of a cockpit indicator, a heading selector, a switch and an amplifier. The cockpit indicator has two main pointers that are always perpendicular to each other, a substantial improvement over the ILS indicator in which cross-pointer angles vary. The heading selector is for the purpose of setting the desired course. A compass needle within the indicator indicates the course actually being flown.

► **Amplifier Feature**—The switch provides for using either altitude control for cross-country flight which is determined by positioning the altimeter to the desired altitude, or the using an ILS system. Two positions are provided for the ILS (calling it possible to use the localizer back course for enhanced flight as well as the standard course for approach).

Flight tests with the Zero Reader indicate that manual ILS approaches can be made with greater accuracy than is possible with the standard ILS cockpit indicator. It simplifies "visual approach" procedures and eliminates the necessary transition from regular flight instruments during cross-country ILS flight to the cross-country type of approach instrument. Both types of instrument usage can be done with the Zero Reader.

Sperry emphasizes that the Zero Reader is not intended to be a primary flight instrument and is no substitute for primary instruments. Rather, it is intended to simplify the job of using primary instruments while retaining the primary instruments as a double-check on the Zero Reader. Improvements in altitudes and flight tests of the Zero Reader will be discussed in a forthcoming issue of AVIATION WEEK.

## Blade Explosion Blasts Wind Tunnel

Explosion failure of one of three blades destroyed all 12 blades of the 32,500-BHP Southern California Compressor Wind Tunnel during a high-speed run Sept. 18.

Buildings and houses within a radius of one block were shaken as if by an earthquake when the blades failed. ► **Damage Limited**—Although the Pasadena, Calif., tunnel housed severely, damage was limited to loss of blades, denting of tunnel walls and tearing seats in the fan area, and probable misalignment of the model holding support system.

Dr. Joseph Sauer, assistant director of the tunnel, told AVIATION WEEK that repair can be completed in two months. He said that the General Electric unit tested at Buffalo, N. Y., may be shifted to run tests for the West Coast industry during the repair period.

# CHECK THESE NAVION FEATURES



1 **SELECTIVE TWO-CONTROL** gear automatic coordination. Forward cross-connected aileron and rudder control provides steering with wheel alone that you have ridden when you want it. Reverse by rudder, aileron, aileron-rudder.



4 **WING-SPINNER ENGINEERING**. The oil-cooled Navion takes heavy duty adaptations at winds. Sturdy construction and thick-skinned wings, fuselage and tail assure safety and low maintenance cost. For permanent houses, double engine (one now standard), choice of 6-cylinder engines.



2 **HIGH-LIFT FLAPS**. Large slotted, full-deflection flaps give the Navion almost 40% lift and range of any plane in its class. Roll only 335 feet. Still maintain wing span for aileron control for maximum safety in slow flight and landings.



5 **LAND-STEADILY** INDIVIDUAL. Forward aileron geared landing under all conditions. Air jacks even from trees, steady throttle landing gear, wide wheel tread and high speed wheel clearance make rough fields and cross-wind landings a smooth, safe, controlled, and hydraulic landing.



3 **FULL-VIEW FARM**. Here's visibility designed for landing traffic. Seven large, clear windows let you see in every direction. No blind spots while flying or taxiing. You can even see a new view station... see 12° down and 18° up.



6 **40-HORSEPOWER** ENGINE. Quiet, well-ventilated, securely enclosed. Elbow and leg room to spare for all three passengers. A flexible frame rails, Navion cabin, 42" wide, 54" long, 52" high. Chassis rails open 2 1/2 feet for more convenient access and exit. Luggage space up to 100 pounds.

7 **RELIABILITY OF PERFORMANCE**. 150 mph. cruising speed, 750 mile range with optional reserve tank. Exhaust air ride. No tail wagging, even in rough air. No other plane offers such intelligently chosen and well-engineered combination of features. For illustrated booklet, demonstration or free business trip, write us today, in your business letterhead.



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## Strike Ends

Boeing workers return, but jurisdictional dispute may be in offing.

Striking workers at the Tacoma/Mapleham Union went back to work last week at the Seattle, Wash., plant of Boeing Aircraft Co., but the company's labor troubles may not be solved.

While the AMU workers were away, the A. F. of L. Teamsters' Union moved in to organize eligible Boeing employees on the basis that the employees were not represented by any union. That union's no grant a victory to AMU, an affiliate of the independent International Association of Machinists, as there weren't too many Boeing workers eligible for Teamsters' membership. But that is all changed.

► **New Union-Denial** J. Brian, grand president of the Teamsters, has advised a new Seattle local, the Tacoma/Mapleham Workers' Union, and the new group is said to organize all Boeing heavy workers, in direct conflict with AMU.

Immediate result was that the Aero-Mechanics burned back to work on Sept. 13 after being out 140 days. The new union was one reason for the return. Others: IAM wary over cost of strike benefits, more than \$2,000,000, deficits of about one-third of AMU's treasury, \$400,000 members.

But another could be jurisdictional trouble at Boeing as the Teamsters' local and the AMU agree to strengthen jurisdiction. Dave Reed, Teamsters' West Coast boss says "this plan would change only if the Aero-Mechanics returned to the A. F. of L."

► **Terms** — Boeing announced it would raise all 8,700 employees who have received "reinstatement" applications to except 18 it has labeled "adversely." Reinstating will be gradual, depending upon work progress from the primary shops into the assembly shops, and that may be expected to extend over a period at least of weeks and perhaps of months.

The workers got back to work under Paragraph 2 (B) of an NLRB trial arbitrator's recommendation which ruled upon the company's refusal to return to their old or equivalent positions with no loss of wages, upon application by the strikers for reinstatement.

The company has hired some 8,800 workers to replace strikers and has announced they will continue on the payroll. With its agreement to reinstate the strikers, it is committing itself to a larger payroll than it has announced as necessary. But Boeing has declared it is willing to sustain a heavy financial strain if necessary. It says that even if several strikers return, the total number of employees

The strikers return to work with a 15-cent an hour wage increase which the company originally had offered, but without a revised settlement of all the other labor practice charges and decisions as to which union is the proper collective bargaining agent set up in NLRB.

## Airport Ratings

Imposed airport services to the private flyer are indicated in the latest airport survey by members of the Aero-Club, Owners and Pilots Association. A total of 717 airports are now holders of the AOPA "above average" and "superior" ratings. The higher rating, "superior" showed an increase from 64 of the last survey to 126 as of July 31, date of the latest report.

The ratings are based on detailed reports filed by individual AOPA members, and indicate that only one airport in about one-third of the total in the country (321) meets the private flyer requirements.

J. B. Hartnett, Jr., AOPA general manager, reports that the survey has made it members increasingly conscious of good and bad airport service, with the result that pilots are going out of their way to stop at airports where service is good. As indication that improved service benefits the operator, he cites the fact that 61 of the 717 airports which received ratings this time, had either attained or improved their last ratings, showing operators' interests in maintaining standards.

## Revised CAA Soon

After three months of study under its task force, headed by E. Edgar Wilson, Reformed, CAA administrator, last week had a new revised organization about just about completed for his agency last preliminary step before putting his organization into effect was to hold a meeting of the administrators of the new CAA regions and top subordinates personnel from the regions and Washington, for a final review of the CAA status quo.

One plan repeated under consideration called for reduction in the number of CAA regions, which would entail considerable shuffling of personnel and dismantling of some staffs. Other plans called for transfer and reorganization of several Washington staff personnel.

Key to the Reformed plan for CAA may be his previously expressed admiration for the frequent interchange of personnel between industry and government based in the Federal Communications Commission. He has expressed a desire for more "new blood" into industry in CAA so that the agency will be in closer touch with the industry it is trying to encourage and regulate.

## End in Sight?

Maguire effects exploratory talks between Port Authority and airlines.

New York's version of the Hatfield McCoy feud, with the Port Authority and some major airlines at title, may be over soon.

When it is over there are still some questions who feel the controversy is no where near ending—a feud will be written in a series of hourly battle reports over landing fees, leases, rights and privileges, spread with either irregularly set changes to their employees for relief use.

The Port Authority, now casting directly with airline representatives in exploratory conferences, is still not fully recovered from the blast it received from Edward C. Maguire, New York's conservative congressman who was supported by Mayor O'Dwyer to effect a sweep.

In a letter to the Mayor, Maguire said that, in his opinion, the strikes were not suggesting the danger of the situation. He was referring to an earlier claim that the Port Authority was wrong for refusing "beyond a doubt" and causing a situation which would leave New York business and employment opportunities in some fields from within.

What the strikes charge is this: The Port Authority stated when it took control of the airports that losses agreed to 1945 between the city and the airlines for use of Idlewild are still valid. In addition, they claim the authority has been forcing foreign flag airlines to move from LaGuardia Field to New York International.

The Port Authority counters: The losses were waived three years ago. They are outdated and unavailable. For safety reasons, the Authority claims, it has asked certain airlines to move from LaGuardia to Idlewild.

The airlines also are concerned over the Authority's policy of issuing temporary permits for airport use available on 30 days' notice. If the Authority restricts on this one, obviously it will be a serious blow to the airlines. The Authority says higher rates for losses.

## Stratostrubbers for Airlines

Fifty-five Boeing Stratostrubbers, 48-passenger transporters awarded an approved type certificate by CAA this month, are on order by an airline. Pass American Airways, Southwestern Airlines, Trans World Airlines, American Overseas Airlines, United Air Lines and BOAC.



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QUALITY AT  
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*beam candlepower*



In clear weather, intensity can be reduced. Lights are usually on most of a student's pass. (Angles are suggested in diagrams to simplify the diagrams.) All lights appear of approximately equal intensity to the pilot.



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L&L—Burton pioneered high intensity lighting and is today's leader, both in quality and in number of installations in operation or being preplanned. Boston, Chicago, LeGuerre, S. E. International, Newark, Minneapolis, St. Paul, Raleigh, Durham, St. Louis, Salt Lake City, Richmond, and others. Many international offices, including Dublin, Shannon, Frankfurt, Hamburg, Canton, Longbeach, Caracas, Panama, and dozens of cities and many boats.



man, he is at a different angle to the beam system and the optical system reduces the intensity so that the light spot is brighter than when he first saw them. The L-M-BARTON system—and only the L-M-BARTON system—makes it possible to use the extremely high beam intensity of 100,000 sq. cm. or greater, to create an "after" or "long" exposure effect, when every foot of distance counts.



## Military Orders Boon to Lockheed

First-half net profit runs to more than \$5 million; procurement billings comprise 71% of total sales.

The semi-annual report recently released by Lockheed Aircraft Corp. is said to contain the initial impact of current procurement.

A net profit of \$5,516,351 or \$4.91 per share was reported for the first six months of this year compared with a net loss of \$4,890,594 for the same period a year ago. Current earnings of \$6.52 million for profit limitations on nonrecourse contracts.

**Two Maxsons**—Involved operating interests are listed on two forms (1) concerning production, which maxsoned efficiency people which in turn brought about cost cuts and higher earnings, and (2) a more forward credit against \$7 million of income as a result of the credit.

However, Lockheed received control of the bulk for \$12,900,000 of bonds, more than its direct obligation. In selling twelve Comstocks to TWA, Lockheed accepted in payment the owner's notes to that amount. Lockheed requested the master with a view to

Higher labor costs due to recent wage increases will add to operating expenses. Also, new contracts received after May 23, 1948, are subject to profit limitations imposed by the Renegotiation Act of 1948.

**Change**—Total aid for the last six months of this year increased to \$65,951,310 with \$46,567,617 at about 71 percent represented by military billings. The change in the character of orders is shown in the June 30, 1948, backlog, amounting to \$190,471,000 of which about 95 percent comprises orders from the military services.

Subsequent to Jan. 30, 1948, Lockwood received an order for five additional Constellation buses from Eastern Air Lines in the amount of \$6,273,000. This brought the total in two Constellation buses under construction for the commercial airlines in addition to the two now being built for the Air Force

Nearly 180 guided cross-country skiers visited Seattle early this month to attend symposiums at Boeing Amphitheater Co. sponsored by the Range Administration Fund of the Resources and Development Board. Seminars were closed because of the coordinated nature of guided wildlife research. Some of those who attended were left in confusion.

**financial back:** TWA has promised to liquidate the specific obligation in 57 equal monthly payments starting on 6-1-92. 20, 10, 10.

★ **Same Mortgage** — Centex-Wright is also holding TWA notes under the same chattel mortgage agreement as payment for Wright's car, and in the Consolidates. On July 31, 1985, the total TWA obligation to both Lockheed and Centex-Wright under the terms of the agreement came to \$10,031,430.

In addition to the TWA notes, Lockheed, as of June 10, 1948, guarantees customers' notes to the amount of \$8,725,000. At the present time, \$680,000 of these notes have been paid off. The unpaid balance is for the account of a foreign airline.

★ **No Diversification**—Lockheed's investment in Pacific Finance Corp. continues to be profitable. As of June 30, 1945 Lockheed owned 294,517 shares of this public company, a 51.6% percent voting control. Carried on Lockheed's books at a cost of \$5,899,789, this investment represents an equity of \$6,851,789 in Pacific Finance's net assets, which is \$1,044,720 in excess of cost.

An additional 16,000 shares of Pacific Finance were acquired separately by Lockhead at a private sale at a cost of \$121,000 or around \$10 per share. It is believed that this Lockhead holding is merely an investment and a source of secondary cash, that it is not indicative of a dissatisfaction in the company's activities.



AT GUIDED MISSILE SYMPOSIUM

Nearly 180 guided birds enthusiasts visited Seattle early this month to attend workshops at Boeing. Amphibie Co. sponsored by the Range Reclamation Fund of the Research and Development Board. Scientists were charged because of the confidential nature of guided birds research. Some of those who attended were left to visit G. P.

Melvin, Signal Corps, Engineering Laboratories, Richard Nelson, Boeing, Dr. W. H. Pickering, California Institute of Technology, Lt. Col. J. A. White, secretary of the economy, Col. G. H. Stahle, White Sands Proving Ground, Col. F. F. Helms, Holloman Air Force Base, and Col. R. H. Coyle, USAF.

## Key Employment in Aircraft Centers

### EMPLOYMENT

Area	April 1944	Jan 1944	Other Key Industry Jan 1944
Bridgport, Conn.	36,500	16,000	35,400
Hartford, Conn.	37,000	16,300	25,000
Bedford, N. Y.	49,000	2,300	115,000
New York, N. Y.	65,500	10,000	270,000
Paterson, N. J.	63,300	13,100	38,400
Newark, N. J.	24,000	7,400	226,100
Philadelphia, Pa.	45,400	1,000	245,100
Baltimore, Md.	42,300	10,600	92,700
Detroit, Mich.	315,000	5,100	436,000
Flint, Mich.	33,000	0	55,000
Albany, Ohio	36,100	3,400	21,000
Cincinnati, Ohio	43,000	1,100	45,000
Cleveland, Ohio	43,500	1,600	200,000
Columbus, Ohio	24,000	4,000	27,000
Cincinnati, Ohio	32,500	3,000	493,000
Evansville, Ind.	20,000	0	22,500
Indianapolis, Ind.	32,800	6,800	46,200
South Bend, Ind.	30,000	0	31,000
Athens, Ga.	25,600	0	14,000
Kennett City, Kenn. Mo.	46,100	0	30,000
Wichita, Kans.	45,200	5,100	5,800
St. Louis, Mo.	17,800	5,400	123,500
Okla. City, Okla.	22,700	0	10,000
Tulsa, Okla.	22,000	0	10,000
Dallas, Tex.	41,900	1,200	35,000
Fort Worth, Tex.	21,700	12,000	3,600
Los Angeles, Calif.	219,100	66,300	197,700
San Diego, Calif.	52,000	14,900	3,500
Seattle, Wash.	41,000	37,400	24,100

Estimates based on U. S. Employment Service figures, and are reports.

Other key industries include mining, chemicals, petroleum, primary and fabricated

metals, machinery, and other transportation equipment.

\*Less than 1,000.

In light labor supply areas, the expanding aircraft industry will have to rely largely on drawing qualified workers from other key industries in the same areas to meet their labor needs.

This is the view of the U. S. Employment Service, which points out that there is little labor surplus in the Great Lakes and Middle Atlantic aircraft centers and that many of the few unemployed are "probably not competitively skilled."

The aircraft manufacturers avoid new workers from other industries in the same general locality, USES asserts, because replacement of the labor supply through migration will be difficult due to the general shortage of housing and other community facilities.

Shortages will not be unusual,

according to USES, but will vary from area to area depending on the volume, occupational skills and the timing of employment contracts required in a given area, the final labor market situation and the competition from other industries for labor in the same area.

A survey of 30 aircraft centers where at least 15,000 aircraft workers were employed in 1944 has been completed by USES, comparing each area with the aircraft employment at the peak of the war (July, 1944) with the employment, as of last January, in aircraft and in key industries which compete with aircraft for labor. The key industries include mining, chemicals, petroleum, primary and fabricated metals, and all machinery and transportation equipment (except aircraft). See table for comparison.

## Lightplanes Show Decline in Exports

Exports of personal planes dropped in July from what they had been in June but was over the 1947 average.

Report by Aircraft Industries Association shows 1918 aircraft, four plane and under, valued at \$184,133, exported by twelve companies in July. This is 55.6 percent of the total number produced by the companies and 12.7 percent of total value.

Competition-July exports totaled 188 planes, 22.5 percent of national production. They \$550,190 value was 75.5 percent of total output. Average number of such planes exported monthly in 1947 was 159.

Trends for the first seven months of 1948 were brought by the July exports to 656 aircraft valued at \$1,402,577.

Personal plane companies reporting were Aerojet, Beech, Bellanca, Cessna, Equestrian & Racquet, Fairchild, Luscombe, Piper, Ryan, Stinson Division of Cessna, Vultee, Taylorcraft and TEMCO.

Largest share of the total—801 planes—went to Australia. Other countries: Uruguay, 9; South Africa, 6; Mexico, 7; France, 6; India, 5; Colombia, 4; Brazil and Canada, 3 each; Switzerland, 2; Belgium, 1 each; Guatemala and Italy, China, 1 each. In addition, Alaska took 4 valued at \$6817.

## Ryan Steps Up Schedule

Ryan Aeronautical Co., San Diego, has increased its production schedule following strike difficulties that cut its Navy deliveries in July to 79. A rate of four Navy aircraft weekly was set in the latter part of August and it is to continue "the least through late autumn." Sixty-one Navy were delivered last month. June figure was 74.

Earl D. Prudden, chief production, reported Navy Air Force order of over \$1 million on Ryan's books Sept. 1.

Company expects to begin production of 108 Army L-17B Navyair late this month.

## Spark Plugs Ordered

Spark plug—135,636 of them—to meet plug requirements for all Air Force C-77 and B-50 during the next year have been ordered from AC Spark Plug Division of General Motors by Air Material Command headquarters at Wright-Patterson Air Force Base. Amounting to nearly \$1 million, the order was described by AC as the largest ever issued for aircraft spark plugs in peacetime. The type AC-141 plug will provide six years for each plug in the popular R-556 Pratt & Whitney engine.

*\*Saves the pump...  
\*Stores fluid under pressure for instant use*



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**BENDIX-PACIFIC 3000 P.S.I.**

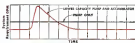
**HYDRAULIC PRESSURE REGULATOR & ACCUMULATOR**

The dependable combination is the proven answer for positive control of 3000 P.S.I. systems. Lighter in weight and removable for longer periods, the Bendix-Pacific Regulator and Accumulator assure simplified system design. They provide means of supplying fluid flow and pressure when desired, yet relieve the pump of continuous operation. Lighter weight of lower capacity which consume less power can then be used, since the Accumulator will supply the additional power requirements of peak system demand, as is graphically illustrated below.

The reliable, smooth operational characteristics of this new Improved Regulator markedly reduce shock action in the system. The Regulator will handle high rates of flow. Quick response operation is inherent and the cut-out pressure can be adjusted through a wide range.

The exclusive Bendix-Pacific Accumulator shell design is

continuous with the regulator. There are no danger and bending moments are minimized. In addition, construction of the bladder provides for flexing over an extended area, prolonging service life. Long extended use of both the Accumulator and Regulator on thousands of military and commercial aircraft has demonstrated that maximum advantages of this dependable combination. Detailed specifications of these and all other Bendix-Pacific hydraulic products are available on request.



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Torture test for

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After hour the torturing test goes on, because there must be no failure when this turbine is finally installed on the sensational new North American F-105 jet fighter.

Pioneering the design and manufacture of refrigeration turbines, heat exchangers, and superchargers to power and air condition the new jets and high altitude transports has been the basic job of AiResearch for nearly a decade. This has called especially for new techniques in building and controlling high-speed wheels and rotors—often operating in excess of 100,000 r.p.m.

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## ENGINEERING



In accelerated corrosion resistance tests of aluminum alloy sheet at National Bureau of Standards, specimen (left) is supported in glass cell containing  $\text{NaClH}_2\text{O}$  solution. At right is the test rack for holding stressed alloy specimens in marine atmosphere.



In accelerated corrosion resistance tests of aluminum alloy sheet at National Bureau of Standards, specimen (left) is supported in glass cell containing  $\text{NaClH}_2\text{O}$  solution. At right is the test rack for holding stressed alloy specimens in marine atmosphere.

## Stress-Corrosion Tests Evaluate Alloys

Resistance of aluminum structural materials studied in accelerated checks and marine-atmosphere exposure.

Corrosion resistance of the water, high strength aluminum alloys have been studied by the National Bureau of Standards to determine their ability to withstand conditions encountered by military planes in tropical areas.

Alloys investigated included 788-T, 8101-T, 8101-V, and the structurally aged 245-T.

Methods and apparatus for accelerated laboratory tests of stressed samples in corrosive solutions were developed and applied by Hugh E. Logan and the staff of the Bureau staff.

According to the Bureau's report, marine-atmosphere exposure tests of the same materials under similar environmental conditions indicate a high

degree of correlation between results of the laboratory tests and what may be expected in actual service.

► **Rate of Corrosion**—Introduced in 1932, the desiccant type of aluminum-copper magnesia of the known as 245-T had largely replaced, within a decade, other aluminum alloys as sheet material for aircraft construction.

Although its resistance to corrosion was generally satisfactory, under some conditions it was appreciably attacked upon exposure to a marine atmosphere.

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or when subjected to an water.

To increase corrosion resistance it has been used in the form of a clad alloy, in which a ductile base is sandwiched between and integrally bonded to, two thin protective layers of non-corrosible pure aluminum. This, however, results in some sacrifice of tensile strength.

As this material has been found to have adequate corrosion resistance in service, it was used as a standard of comparison in the marine atmosphere tests.

► **Alloy Properties**—With the advent of the war in 1939, stronger aluminum al-

loys became desirable for aircraft use. Efforts were made to develop alloys of greater tensile strength with adequate corrosion resistance.

In the R30-T alloy, this result was sought by covering a ductile base alloy with an alloy cladding layer of higher strength than conventionally pure aluminum.

In the T35-T and R30-T alloys, tensile properties were improved by the addition of appreciable amounts of zinc.

The zinc also made the specimens that cladded/corrosion aging of the commercial flat 2024 alloy results in a marked increase in yield strength.

► **Tests Made**—In the Bureau's investigation of the stress-corrosion resistance of these new materials, standard American Society for Testing Materials but tensile specimens with 1-in. reduced sections were tested both in the laboratory and in a marine atmosphere in dry air stress equal to three-fourths of the yield strength.

In the laboratory, stressed samples of all alloys were continuously immersed in a sodium chloride-hydrogen peroxide solution (NaCl 1%, 30 percent H<sub>2</sub>O<sub>2</sub>, 1.5 ml. HCl, 980 ml.). These containing also as an alloying element (R30-T and T35-T) were also exposed to a boiling 6 percent solution of sodium chloride.

Unstressed specimens were subjected to the same corrosive conditions so that the effect of stress on corrosion erosion damage could be evaluated.

All clad materials were tested with the cladding intact since the purpose of the studies was to determine the resistance of the commercial alloy, in actually used other than that of the core material itself.

Losses in ultimate tensile strength and percent elongation were taken as criteria of corrosion damage.

► **Insurances**—Oxidation, leaching—Specimens supported vertically and stressed via weighted levers were tested in the sodium chloride-hydrogen peroxide solution in cells made of 60-iron cylinders. Pyrex tubes fitted at each end into slotted Bakelite disks. Rubber gaskets placed between the Bakelite and the glass, and rubber stoppers molded with rectangular slots slightly smaller than the top ends of the specimens completed the cell assemblies.

Specimens up to 0.064 in. thick, were kept in the sodium chloride-hydrogen peroxide solution for 24 hr.

One eighth inch specimens were air dried for 72 hr., the solution being removed at the end of each 24-hr. period.

Inspection of a specimen under stress automatically opened a lamp switch in the event of a released specimen without any action on man's part by a clock. Time required for failure of the specimen was thus recorded in terms of 1/10 hr.

After removal from the solution and cleaning, the specimens were broken in a hydraulic-type tensile testing machine to determine the tensile properties of the corroded material.

Micrographic examinations were also made to determine the types of corrosion that had developed.

For marine-atmosphere exposure tests, the specimens were supported vertically in a similar fashion but were left exposed to the atmosphere.

Specimens immersed in boiling sodium chloride solution were stressed by heating, utilizing a threaded steel

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end, insulating sections slotted to hold the ends of the specimen, and two nuts adjacent to the sections for tension adjustment.

The specimens were then placed in water-saturated flasks connected to nitrogen condensers and containing the sodium chloride solution. They remained in the testing solution for 14 days, unless earlier failure occurred. At the end of this time they were removed, cleaned, and before in tensile tests.

One of the difficulties in stressing specimens by bending has been because extremely small changes in the length

of the chord connecting the ends of the specimen will make appreciable changes in the stress in the entire fiber.

However, an instrument was constructed by means of which the distance from the chord to the outer fiber could be measured to 0.001 in. and the stress computed much more precisely from by certain methods.

Essentially, this device consists of two fixed pins and, between them, a third removable pin, which is attached to the plunger of a dial gage. Strains computed from dial gage readings differed from strains obtained from wire strain gages (attached to the corners and cen-

ter surfaces of the specimen) by less than 1 percent at 1 of the yield strength. **Test Data—Results of the strength-test indicate that flat, bare 24S-T aluminum alloy sheet aged 4 hr. at longer at 375 F. is not susceptible to stress-corrosion cracking in either the laboratory or service atmosphere tests, and is at least as resistant to the combined action of stress and corrosion as the commercially heat-treated test coupon material.**

It was found that aging of a sample of the alloy for 2 hr. at 380 F. produced an increase in yield strength of about 25 percent above an initial value of approximately 90,000 psi, an increase in tensile strength of about 3 percent above an initial value of approximately 76,000 psi, and a decrease of about 2 1/2 in the initial elongation of 17 to 18 percent.

Similar results were obtained when the material was aged for 24 hr. at 150 F., 5 hr. at 375 F., or 14 hr. at 400 F.

Samples of other alloys that were tested, with the exception of R301-T7, were found by the Bureau to be relatively resistant to stress-corrosion cracking. Failure of the R301-T7 samples was attributed by the researchers to the result of the penetration of stress-corrosion into the core material of the machined edges of the relatively narrow (3/16 in. wide) specimens that were tested. But such damage, the Bureau reports, would probably not be significant in wide sheets, particularly those not by drawing.

In general, it is claimed, it was apparent that the short-time laboratory tests give a good indication of the corrosion resistance to be expected of the material when in a marine atmosphere. However, results of continuous immersion tests on clad aluminum in the laboratory do not necessarily agree with those obtained by exposure to a marine atmosphere.

#### Reference

Logan, H. L., and Hirsing, H., "Stress-Corrosion Tests on High-Strength Aluminum Alloy Sheet," *J. Research NBS* 45, 68 (1940) RP4705.

#### Propeller Improved

New contracts in testwork in propeller woods a pump made by Propeller Div., C. B. Leach Co., Waco, Tex. Researched some bond the larger number of laminations to provide increased strength and longer life. Dadi black throat into themselves and new impregnating varnish is in sealed to give greater durability and better performance. Stainless steel top ring extends close to hub and is ground down to extremely smooth surface.

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Of course, there is no letter "X" in the words "jet propulsion", but, in the development of jet engines, a very big and important "X" was the design of a fuel pump for this service. This was as tough a problem as any ever tackled by Peeco engineers, and here are a few of the reasons why . . .

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the real sticker . . . since gasoline has no lubricating qualities, the wear of internal parts increased much more rapidly with higher pressures.

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The success of Peeco's solution to the "X" in jet propulsion is attested by the fact that today every American production jet engine uses a Peeco high pressure fuel pump.







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In the pressurized cockpit of the X.B. 47, the flat and curved panels of the windshields, windows, and canopy are developed in airplane glassing. Made of a special type of Pyrex (fused fused silica) glass and plastic material by "Pittsburgh," they are free from optical distortion, comparatively light in weight, yet full resistant. It is a different method of joining the windshields of the panels in each other and in the fuselage in a fresh assembly, subject to the entire assembly, rigidity and strength that none thus meet the structural requirements.



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## NEW AIRCRAFT



## Seagull Features Pivoted Wing

British amphibian, now undergoing its taxi tests, uses variable-incidence wing for shorter takeoff runs.

Taxiing trials are now taking place in Northampton. Walter of Vickers-Armstrong's new amphibian, the Seagull.

Conceived in 1944 as potentially useful in the event of a down-out war in the Pacific, the craft will probably not now be ordered in quantity for British naval aviation.

Developed by Vickers-Armstrong's Supermarine Division to succeed the well-known Walrus and Sea Otter amphibian ability planes, and like them, intended for air-sea rescue, reconnaissance, and fleet spotting, it has longer range, more speed, and better performance.

◆ **Noel Wing**—Chief interest is the variable incidence wing, which pivots at the roots and can be inclined at a higher attack angle for better takeoffs with shorter runs and to develop a very high lift coefficient which should make possible side landings at much lower speeds.

Lift is also improved via interconnected full open, leading edge slots and flaps.

Pre-operated wing folding permits viewage aboard ships in narrow spaces.

Main gear and tail wheel retract hydraulically. The water-operation solely, the landing wheels can be quickly de-

tached for a cross-look, can be fitted for operation from carrier decks.

The Seagull is powered by a single Rolls Royce Griffon liquid cooled, 12-cyl., low engine, driving fixed constant-speed propellers.

The power plant develops 2200 hp at takeoff, with water-cooled injection and 25 psi boost, and gives maximum speed of 360 mph at 11,000 ft, when fully supercharged.

◆ **Performance**—Range at average cruising speed of 171 mph is 875 mi. with normal gross weight of 14,900 lb. With two extra 40-gal. wing tanks, range is increased to 1230 mi.

Empty weight (on amphibian) is 10,510 lb., weight of fuel (285 gal. on internal tanks), 2012 lb., and 13 gal., 72 lb., and service load is 1866 lb. Span is 52 ft. 6 in., and maximum width with wings folded is 31 ft. Wing area is 452 sq. ft., length is 44 ft. 10 in.

At normal gross weight, takeoff time on water is 22 sec. or 16 sec., distance on land is still sec. is 765 ft., and distance on carrier deck, on 51-gal. wing is 317 ft.

Stalling speed at landing weight at 12,750 ft. is 50 mph with engine off, 54 mph engine on.

The Seagull's normal wing loading is 11.60 lb. per sq. ft. Normal power loading at takeoff is 5.80 lb. per hp.

The craft's service ceiling is 23,700 ft.

At the required maximum test flight could be completed as true, the Seagull was to be shown at Society of British Aircraft Constructors' recent exhibit at Farnborough.

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The Beechcraft Bonanza (Model 33) is the world's first aircraft to feature a new system of Beech Aircraft Corporation, Wichita, Kansas, Inc. a FEATHER-WIGHT all-aluminum oil cooler built into its Beech-designed "Cool-Tank".

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Author Freds stands beside Bonanza low plane "Lark," built by Skunk Creek Aero Industry.

## Europe's Progress In Lightplanes

Design details of postwar personal aircraft abroad offer noteworthy features meriting study by our own industry.

### Editor's Note

AVIATION WEEK presents here the first comparative article analyzing the postwar lightplanes of Europe, written by a recognized American authority on the subject. Few American engineers are better qualified than Ed Fodas to pass judgment on the European counterpart of American postwar personal planes. As manager

of Automatic Propeller Department of Kappan Co., Inc., Baltimore, Md., Fodas has had opportunity to fly most European personal planes, ground and pattern, in the same weight and power categories as those he describes. The result of this comparative experience is evident in the analysis which follows on the succeeding pages.



French S.P.A. sport plane is two-place, 85-hp, 125-mph. craft.

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## Europe's Lightplanes

By Aubrey H. Folan

A previous aviation survey through England, Denmark, Sweden, France, The Netherlands and Switzerland, to determine existing potential for export business for American propellers, and to lay the ground work for design in mass of the propeller, has produced a general impression that business in Europe is Western Europe is on the rise.

Many economic and political handicaps have kept most of the continent. But in spite of these, the people of new nations are working, and the spirit they demonstrated could not help but inspire the belief that they will definitely recover.

I was encouraged regarding production of light aircraft and the degree of Government sponsorship of new design. That was true in every country was under the strictest parity allowance of strategic materials. The export market for this leading air safety security (development of pilots), export trade, and local national industry.

**Competition for U.S.-I** visited aircraft plants and flew airplanes in all these countries and was impressed with the advanced design and performance. Some of the sales departments were talked about competing on an export basis with the American market. Therefore, I present to you how this is possible in the limited production and higher cost of materials more than offset the direct labor wage scale advantage.

The general European market today is comparable to the American market in 1946 where the obsolete equipment of power use has not yet been supplanted by postwar aircraft production.

Each country is competing for its neighbor's export market in the same sense as American manufacturers of light aircraft compete with each other for the American market.

In the Western Hemisphere the air lines of Canada and South America were mentioned. The advantage of trading from a European aviation may have several factors, like the establishment of money reserve, as in the case of South America where a trading outlet is presently established and exchanged for British purchases of fuel from Australia. When this credit became substantial, the movement of trade in sterling goods is reflected in the reduced tariffs.

At that time the dollar could not be low enough to encourage trade in massive traffic on dollar products. Regardless of political apprehensions, the investment and development of trade channels by England, for example, still



Model of Henson, Wain & Steel "Satellite" biplane, 250 hp engine.



Dutch Fokker "Pampero" biplane, 100 hp engine.

put them in a very advantageous position for doing business within the sterling block.

The following observations represent the result of contact with some of the manufacturers of light aircraft in the above-mentioned countries.

In England, Miles Aircraft, Ltd., Aerodrome, Reading, Berkshire, was producing the biplane "Cocaine". The present version of this aircraft is to have two 125 hp Continental engines with Accurate propellers, it favors exchange values. Their current plan is to increase export sales in the conduct of a world tour with this model. Two of the principal sales targets are Canada and the United States (Editor's Note: Privileges given for this visit are now uncertain. Since the author's trip, the company has been rejected by Canada).

The four passenger ship is required to have a maximum level flight speed of 150 mph with the Continental engine. It is also required to have a single engine rating. Several of these airplanes are flying in England, with de Havilland engines, and a rather inferior production aircraft line has been provided for.

The design configuration is low wing, retractable landing gear with the two engine engines mounted forward of the landing gear. This design is all

intended to provide pilots, as it represents a business landscape in the private flyer's class that, in fact, has not been brought to a successful commercial offering in America, although the Langley tackled several blunders in the Soviet made such an attempt.

**Satellite** — Another interesting new British development is the "Satellite" which presents many unique design features. This plane was designed by Henson, Wain & Steel, 25 Chiswick Street, Pinner, London. It is a two-place, all-metal monoplane, the first private aircraft to be constructed of welded magnesium sections which will achieve weight by 15 percent.

The fuselage is of aluminum frame, being constructed entirely of magnesium about 50 percent of upper half of the front portion which consists of welded aluminum. The pilot's position is merged into the general form without the usual windshield projecting into the streamlines. The portion behind the cockpit is in the form of a tapering tube of sufficient thickness to provide its own stiffening without ribs or struts.

The de Havilland Gipsy Queen engine is mounted behind the cabin in the center of the fuselage immediately behind the engine is a joint which allows for removal of the rear portion



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of the fuselage, leaving the front portion supported by the tricycle undercarriage. This is not unusual as inspection of the engine. An article at the top of the fuselage closes air by a suction fan through the gills of the cylinder and passes out through a conical vent.

A unique propeller shaft is connected to the engine by a flexible coupling and coupling bell. The Aeromarine propeller is mounted off of the tail surface. A built-in bell and a rudder, acting in both directions and rudder. A third surface, vertically disposed, acts as a yawing stabilizer and propeller governor in event of a tail-down landing. The tricycle landing gear is retractable.

Two alternate power plants are offered—the Cypres 1200 with 250 hp and the Cypres Major with 162 hp. Estimated level flight speeds are 260 mph for the Cypres, 275 for the Major.

The prototype of this aircraft is now in the hands of inspection and flight tests will be conducted very shortly.

► Danish Lark-In Copenhagen, Denmark, I visited Skandinavisk Aero Industri, Skovbovej, Solbjerg. This firm is in production of a four-place airplane equipped for export with a Continental 225-hp engine and an Aeromarine propeller.

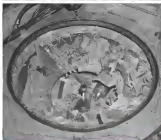
This craft, called the KZ-VII Lark, is constructed of fabric with metal tubing fuselage and wings of two spar wood structure with plywood and fabric covering. It is a high-wing, fixed landing gear configuration similar to the Skovbo Vopros, only not as luxurious. Maximum speed is 125 mph.

A noteworthy design feature is a complete leading edge slot with Fowler-type flaps extending over the entire trailing edge of the wing including the aileron portion which acts in combination with the flap through a differential connection to the flap lever. This extensive flap and leading edge combination allows the Lark to track down at between 20 and 30 mph with steady, free stability.

The high lift configuration coupled with the Aeromarine propeller tend to utilize substantially 195 hp total output permits an exceptionally short take-off run. The cabin seems adequate for low-passenger comfort. The engine in general is a low-speed, high utility design aimed at a market similar to that competed for this year by various American manufacturers in the low-cost, four-place aircraft class.

► Design Efficiency—In speaking of passenger comfort a few remarks should be made to amplify the design reasons why some of the foreign aircraft exhibit lower horsepower per passenger than American designs do. Some of our concept of passenger comfort comes from our past conscious sense of transportation. The automobile. With this as

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Aircraft engines are working with speeds of 30,000 r.p.m. and speed on large-size parts containing peripheral speeds approaching 15,000 feet per second on parts of all types.

What is the factor of safety in such parts? The answer comes two ways with destruction tests such as that shown here, in which speeds up to 61,000 r.p.m. have been recorded, or with continued runs well above the required speed of the part, by which safe performance at operating speed is assured. Stress-testing of such parts for experimental runs adds to the designer's knowledge.

Such tests, and the facilities for them, constitute a part of Alcoa service to an industry to which we have been a major supplier since the days of the first American airplane. Aircraft and accessory manufacturers are urged to make full use of the High-Metal Knowledge, and the facilities for obtaining it. ALUMINUM COMPANY OF AMERICA, 2302 Gulf Bldg., Pittsburgh 13, Pennsylvania. Sales offices in principal cities.

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a constant criterion, a quick comparison of European automobile design will account for the difference in cabin space available for passengers.

The popular European automobiles allow at least an third less space for the same number of passengers in American design. Examples are the Lincoln Continental, the Buick Wildcat, the Cadillac and the Fiat. In these, the space of a loved for a so-called first passenger accommodation is comparable to that in our over-crowded bus, usually designed for men people and with sufficient capacity for three.

In the present stage of private airplane development, we are becoming more conscious of safety, and to achieve it, may be willing to sacrifice high speed and maximum comfort. Actually, on cross-country flights, even in large countries like the United States, we do not conceive of ordinary flights of more than three hours duration. This is prompted not only by physical discomfort, but also the severe fatigue resulting from the continuous condition of noise and vibration.

The performance of safety in some of the foreign design may have a strong argument, or, as in the automobile, may only be applicable to foreign aircraft design because of the acceptance of similar comforts in other means of transportation by those people. A trend in this direction is to be noted in the designs by Dornier, Ansonia, Cessna, and Luscombe, to mention a few American manufacturers thinking along these lines.

Sweden-A very attractive three- or four-place, all-metal, low-wing airplane is the "Safe" built by the S A A B Aircraft Co. of Linköping, Sweden. This company is the largest aircraft manufacturer in Sweden, and is responsible for all military and transport design and aircraft production in that country. Its facilities are equivalent in size and modernization to our larger aircraft construction.

In the three-place version with 150 hp de Havilland Gipsy engine, the maximum speed is 145 mph. The fuel tank is located just in the rear passenger seat. The feature of carrying the fuel tank in the cabin was incorporated to eliminate complications of wing de-assembly. It is intended, under crowded conditions, to dampen the wing by hanging, and reduce danger until the simplicity of the wing attachment point and control surface rods is such that actual assembly with two people can be accomplished in five minutes.

It is interesting here to see the capriciousness given by an aircraft designer to as practical a problem as the cost of hanging wing. We have approached the problem from the point of design and fabrication of individual hangars to effect lower cost. The approach from

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Working out in gallons of gas, weighing it, then calculating the full load weight limit is now as old as time as fueling with a hand pump!

The new GRANCO Temperature Compensating Meter automatically gives you your fuel load weight in pounds on a meter where the mercury stands on the correct thermometer. And does it with speed and precision.

The Model TE GRANCO will compensate for temperature fluctuations from zero to 250 degrees F., or liquids having a range of 0002 to .0009 coefficient of expansion. It automatically allows for expansion and contraction, and computes all measurement back to 60°F.



Model TE (left) also available in 200, 250, and 500 lb. capacity.

### LASTING, ACCURATE PERFORMANCE

The GRANCO Temperature Compensating Meter is built into the meter shell and is at all times in direct contact with liquid measured. It reads instantly in any fuel tank temperature change, requires no manual handling or cleaning and is not affected by oil and dirt. Since there is nothing to wear, the Temperature Compensating device will last the life of the meter.

GRANCO meters are noted for longevity and constant accurate performance. The new GRANCO 50 lb. Meter has these qualities built into the design—constant temperature compensation, built for working accuracy, ruggedness and maintenance-free design.

These read no complex calculations and verify design data—no "CUT and TRY" Temperature Compensating device. 1—Professional design is a Granco.

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# Granco

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One makers of On-line Gravity Positive Displacement Pump

# Whittaker SLIDING GATE VALVES A NEW VALVE

Off the drafting board comes another Whittaker specialized valve designed for the world's most modern aircraft—the record-breaking jets. Thoroughly tested and proven in flight, these compact shut-off valves control the fiery blast of hot air taken from an intermediate state of the jet engine compressor. This hot air performs vital functions in jet aircraft such as wing de-icing, fuel tank pressurization, windshield defrosting, cabin air temperature and pressure regulation, and ammunition temperature control. This new Whittaker valve, which may be operated electrically or manually, is being installed on virtually all jet-propelled aircraft now under construction by leading manufacturers.

In typical installations, the large 3½" Whittaker Hot Air Valve controls the mass compressed air taken off from the jet engine. Then to control the hot air further, smaller Whittaker valves ranging from 1½" to 2" in diameter allow the pilot to defrost the windshield, de-ice the wings, etc.

Famous for aircraft valves embodying advanced engineering techniques and design, Whittaker maintains their position as the leader in producing outstanding valves with this new line of Hot Air Valves. For positive control of large volume air flow at high temperatures, specify Whittaker Hot Air Valves—the newest addition to the Whittaker line.

Whittaker 3½" Hot Air Valve equipped with Whittaker actuator. Powerpack combines fully to AN M-36 specification.

## BRIEF OPERATING SPECIFICATIONS

Temperature	to 500° F.
Pressure	to 120 psi
Size, port dia.	1½", 2", 2½", 3", 3½", 4", 5"
Flow	one direction



Write for your copy of Whittaker "AIRCRAFT VALVES" for information on the hot air valves, slide valves and other plug and check valves manufactured by Whittaker. Describe and illustrate most popular Whittaker valves and give operating specifications.

WM. B. WHITTAKER CO. LTD., 912 N. Canal Ave., Los Angeles 26, Calif. Sales representative: AERO ENGINEERING INC., Rossmore Park, Manassas 31, Va.

# CONTROL HOT AIR IN JET AIRCRAFT FOR A NEW SERVICE



## OUTSTANDING DESIGN FEATURES

COMPOUNDED SLIDE—flowed heat-treated sliding rings provide a positive seal at 500° F. and 120 psi, with sliding force less than one per cent of maximum rated flow.

POSITIVE LOW-TORQUE SLIDE OPERATION—sliding gate operates on ball bearing supported track. This ensures smooth, easy operation regardless of port size or operating pressure.



FAST OPENING



SLOW CLOSING



TWO-SPEED TRANS MISSION—select two speed transmission at your will as optional equipment on motor-operated valves. Forward valve to open slowly (up to 12 seconds) and close quickly (less than 1 second).

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Lever Air Motor-Operated Sliding Gate Shut-Off Valves • Diaphragm Plug Valves • 3-Way Plug Valves • 4-Way Selection Plug Valves  
Spring-Loaded Valves • Hydraulic Check Valves • Hot Air Valves





Swiss Pilatus biplane utility plane.



Morane-Saulnier's Model 571.

utilized Vickers, Koster, Pugh Pacific with their Wheeler, and Bendis in the west.

Having followed progress on American prototype attempts using the Aero-matic propeller, it was interesting and somewhat surprising to see one successful answer to the tricky problem that retarded American construction of this design.

M. Becking, vice president and director of engineering for Polaris, revealed many of the steps taken by Aero-matic manufacturers, such as changes in size and location of air intake, crankshaft extension for best location of propeller and to eliminate inward terminal oscillatory vibration, and general streamlining studies to produce an efficient laminar flow over the fuselage contour. Details of increased visibility and engine accessibility are apparent.

The ship is a sleek, combination with retractable bicycle landing gear. One oddity exists in the wing arrangement with the pilot seat forward and a seat accommodating three passengers in the rear. This arrangement evolved itself and was dictated by the resultant C.G. location.

The estimated level flight speed of 115 mph was substantially exceeded by the prototype which was consistently doing better than 140 mph. The esti-

mated climb rate was sensitive to altitude, and the stability, both lateral and longitudinal, are superior in all attitudes of flight. The standard production model of the engine is equipped with 170-hp Lycoming 190 hp engine and the Aero-matic propeller. Production planning for this aircraft is underway, and it is probable that many of these models will be in use this year.

► **France-In France**, the aircraft plant of Morane-Saulnier at 3 Rue Voltaire (Paris) was visited. This firm is one of the oldest French builders of airplanes, both commercial and military. They have several popular designs in progress and are interested in producing American power plants and propellers, most particularly for the models they intend to export.

Some of their prototype designs include a single engine, low-wing, fixed landing gear airplane of about 40 hp and a two-place version of a similar design with approximately 65 hp, known as the Model 600. Apparently the final cost and size of primary construction in these two models in these designs were very close and much more productive than pretty.

The more advanced models, like the MS 571, a three-place, low-wing, bicycle-actuated landing gear, powered with 140 hp Renault engine, and its proposed low-price export version with

a Lycoming 190 hp engine and Aero-matic propeller, represented the sleek, aerodynamic design similar to our Navy. Significantly here was modelled into the construction using a sliding canopy for cabin entrance. The lines and detail were very pleasing and comfortable. A feature unique of this airplane with the conventional use of two 190-hp engines represented a high utility design with ample payload space to allow its use for general charter, tourist, ambulance, or rescue transport.

A highlight in this horsepower range was interesting to see because it represents a gap still unfilled by American design but necessarily an ultimate design that we shall meet for years to come. For comparable purposes, we do not have an American design of an effective transport allowing liaison safety for instrument and night flying, the role of a Beech Model 18 at around \$60,000.

► **Need Design**—The next French firm visited was Societe Nationale de Constructions Aeronautiques, du Nord, 20 Rue Vercors, Paris, which is the manufacturer of Nordavia Model Nord 1570. This is a three-place, sleek, low-wing, bicycle-actuated landing gear airplane which has won several performance prizes in French competition. Very retractable, little, low-cost and low-wing plane carries three people at 165 mph with a 140-hp engine.

Flight tests have just been completed on this ship with the Continental 125-hp engine and Aero-matic propeller. The maximum speed with this lower horsepower engine is 152 mph. Compensation for the reduced speed is less fuel consumption and longer range. A unique construction feature is the use of an extremely padded dash instead of the conventional internal structure. Apparently from the performance, this type of external structure need not create prohibitive drag.

Appliance provisions at all times command respect for foreign officials.

This plant is owned and operated by the French Government. The Societe Industrielle Pour L'Aeronautique, abbreviated S.I.P.A., at 20 Rue de Font, Neuilly-sur-Seine, is a nationalized factory which has previously produced a model known as the S-91. This is a two-place airplane. The current version is equipped with the Continental 81-hp engine with Aero-matic propeller in standard equipment.

This machine resembles the previous Collet-Godet in its construction and configuration. Its flight characteristics were also similar, with the same degree of reaction control from the movable ailerons. The level flight speed is 115 mph, with a climb rate of 100 ft/min. Located in a parkland location at the base of a snow-capped mountain range in Switzerland, the

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As this work continues, further important developments appear. A few of these, which promise great forward strides in air progress, are discussed on these pages. And Westinghouse will continue to explore new and better methods of solving the problems of aviation.

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**A Super-Hot Fuel Atomizer.** Here's a product of Westinghouse research that solves an old problem in fuel combustion—the old problem of inefficient carbon formation in fuel chambers. It's a new fuel nozzle for aviation gas turbines that provides a spray so fine that superior combustion and greater combustion efficiency are obtained over the entire speed range. This means more power per gallon of fuel, less maintenance and new economy in aircraft operation. The difference between the old and the new is dramatically evident in the photo at the right.



**High Temperature Metallurgy.** Of enormous consequence to gas turbine engines, jet propellers and superchargers are recent Westinghouse developments in high temperature alloys—Kovar, Inconel and Duralloy.

These are not just two alloys, but a family of metals having high strength at high temperatures. Exact proportions, precise annealing and careful rolling practices give each metal the qualities required for a particular high-temperature application.

It's a development that paves the way for further advances in high-temperature jet propellers and gas turbine engines for aircraft.



**The Westinghouse Asystop.** For greater flight safety of tomorrow's planes . . . Westinghouse has developed experimentally a remarkable new flight control system. It utilizes the most microscopic principle of the tank gas cylinder . . . the development by Westinghouse for 50,000 American tanks.

This new Asystop can be used either to maintain a fixed course and altitude, or maneuver the plane with a regulated angular velocity in response to thrust-up controls. The complete control, of which the Gyro Control Unit (an experimental form straight) is the heart, will weigh between 25 and 50 pounds, depending on the plane to which it is applied. It's not, at present, available commercially.



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## FINANCIAL

### Airline Problem in RFC's Lap

Analysis points to Congress as basic key to ultimate solution of carriers' financial difficulties.

The financial predicament of the airline industry has led President Truman to direct the Reconstruction Finance Corp. to make a study of the industry's finances and to advance recommendations for necessary corrective action.

The RFC is being asked to determine the type of financing best suited to the industry not only for its immediate requirements but also for its long-range development.

► **Credit Standing.**—The low credit standing of the airlines and their general inability to obtain needed funds by equipment and other capital expenditures have led to the supposition that a few loans here and there are all that are necessary to cure the ailments of the industry. Presumably, it is this philosophy which motivated the directive setting the special RFC study in operation.

This approach ignores attention to the symptoms rather than the cause. Adequately new capital will be forthcoming to the airlines not in regard to raising power or the hope of raising power is accorded to the individual airlines. The accomplishment of this objective will require a major overhaul of the airline network, and new concepts of operating controls. Such effective revisions would require Congressional sanction and involve a conventional and time-consuming process.

► **APC Study.**—Last year, Mr. Truman's own Air Policy Commission made an exhaustive examination of the industry's problems. While some of its final recommendations were most general in nature, it is not believed that even these suggestions received active White House support. The Congressional Aviation Policy Board next year needs the same go-ahead, was inclined to be a little more specific and implemented a few long-range proposals of its own in the form of legislation at the last legislative session of Congress.

Without first understanding the industry's basic conditions and problems, the RFC can hope to accomplish but little in its current study.

► **Predefined.**—The airline financing predicament cannot be solved by a schematically made device such as the equipment trust proposal. Any program of equipment trust financing must fit

in part of the general capital structure of the companies involved.

At present, however, considerable support has been found for a government-owned corporation to loan to transporters and lease them to the commercial carriers. The problems of a consolidated airline trust hardly be solved in this manner.

► **Equip-Spare.** parts for the equipment trust are required and generally run about 25 percent and more of the cost of the planes. Further, adequate facilities for maintenance, repair, and overhaul operations must be provided. It is essential to maintain complete stock, spare parts and advance inventory services. All these functions require capital outlay and these first capital be equipment trust financing whether from a government agency or through private channels.

The airlines in a group have a serious record for operating on perpetually low working capital balances. While the industry is actually on a cash basis with its passenger and cargo services, airlines' debts on long-term contracts are in excess. For in these studies or sudden granting of equipment can correct into immediate liabilities advance ticket sales which as a part of current costs and provide cash resources for working balances.

► **Various Forms.**—The rapid expansion of airline capital structures necessitates following the pattern period has created various forms of indebtedness. Such obligations have appeared in different commercial loans both secured and unsecured and of a short or long-term nature. When equally unsecured, such obligations represented for as much as 50 percent of capitalization in many instances.

The high debt ratio has proved as sound under adverse operating conditions. Thus at the minimum of the Hughes' airline as capital stock, the TWA capitalization "above water" was only entirely of borrowed funds.

In other words, the book value of the equity was completely liquidated by mounting deficits.

► **Equipment Predilection.**—Most of the debts in the airline industry were incurred to finance equipment purchases. However, such funds were not always

employed for this purpose. Because of the legal obligation to equipment trust, many scattered loans were also directed.

It was believed that by accepting negative pledge clauses, adequate protection would be afforded the lender. Actually, however, this equipment has not always yielded out as planned. In some cases, money originally intended for plane purchases was diverted to operating purposes. Or greater support—

the airlines lost much flexibility in any future financing proposals.

► **Charles McNamara.**—Nevertheless, the equipment trust device may be expected to figure prominently in providing much needed financing for the airlines. A few of the legal and industrial obstacles which have generally retarded the adoption of the equipment trust vehicles were removed at the last legislative session of Congress.

A major hurdle remains in the minimum status of equipment under the proposed airline trust agreement in the event of bankruptcy. A paper amendment to the Bankruptcy Act was prepared but was found to have certain modifications. Another amendment was introduced at the following session.

► **Pay As You Go.**—To the limited extent that equipment trusts have met with considerable success in the transport field, the American Airman was the first and thus far the only line to resort to true equipment trust financing. This was done in January, 1938.

The principle of trust financing was present when American Airlines, Inc. in 1935, obtained a loan from the RFC to pay for its first fleet of DC-3s, which gave the carrier a jump on the airline lines in equipment. The commercial loads reduced to advance air funds but this type of financing, main among the industry, was too risky. RFC then began advanced the money at 5 percent, taking a default mortgage on the planes, with American making a 40 percent deposit and amortizing the loan on a monthly basis.

► **NWA Loan.**—A few years later, Northwest Airlines obtained a similar loan from the RFC.

Whether he lives is the only carrier with loans outstanding from the RFC at the present time. In December, 1947, this carrier, by giving various rights, received a \$14 million loan from the RFC at 4 percent interest to adjust its previous obligations. Last July, an additional credit of \$5.3 million was made available to further finance a fleet of Douglas. Then last, only \$600,000 of this additional credit has been drawn down.

► **Producers.**—Before the RFC can advance a loan to a certified airline, CAB must state first whether "on the basis of present and prospective

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carriage, may be expected to meet its final changes without a reduction thereof through patient negotiation." This requirement alone virtually forces "prudent" handling judgment on the part of the RFC.

The basic criterion in sound airline financing should be the ability of the carrier to develop sustained earning power. Under such circumstances, an air carrier may be expected to expect some little if any difficulty in obtaining the necessary equipment financing at such slight accommodations as may be required.

With a favorable outlook for earnings, the lender can anticipate the regular amortization of outstanding obligations. Generally, such recent modernization under those conditions, will be possible fortuitously through private channels or favorable terms, thus obscuring the need of the RFC to be of any assistance.

For the RFC to make loans to the airlines on one other basis would place such advances in the same category as grants currently being made under the Stimulus Plan—Selig Altschul.

## Solar Year Good, Menasco Surplus Up

Solar Aircraft Co., San Diego and Menasco has reported net income of \$500,967—largest in the company's history—for the fiscal year ended Apr. 30, 1948. For the year previous, Solar showed a loss of \$189,065.

Earnings per share of common stock were \$1.40, against a deficit per share of \$1.49 in 1947. Sales for the past fiscal year of \$14,473,336 compare with \$11,290,112 for the year ended Apr. 30, 1947, an increase of approximately 25 percent. Company notes that its earnings available for common stock in the business and for dividends in fiscal 1948 were the largest in its experience.

**Buyer Plans—Solar**, which builds jet conversions and related systems has purchased for about \$775,000 the plant and equipment of Don Menasco, president of the Reconstruction Finance Corp. President Edmund Y. Price reported that bank loans stood at \$670,000 at the end of the 1948 fiscal year, and had been reduced to \$770,000 by June 30, 1948, date of his report. Amount used to reduce bank loans during the year ended Apr. 30 was \$1,360,000.

In another fiscal year report, Mexican Manufacturing Co., Burbank, Calif. showed net sales for the twelve months ended June 30, 1948, of \$1,971,657. Total increase in earned surplus was \$77,571, including \$14,915 in operating profit and \$62,656 in recovery of tax refunds and other items reflecting prior years' operations.

## ATTENTION all DC-4 Operators

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When you need manifold replacements, order from the Douglas Aircraft Company to get the finest built replacement parts available. The Douglas Aircraft Company has the largest stock of replacement parts for all Douglas aircraft. They are available through all Douglas dealers. Order now to get the best replacement parts for your Douglas aircraft.

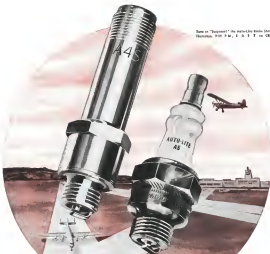
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Name of "Recipient": He started his studio (Stone Mountain, 1988) at 100 E. 4th St. in CDT.

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W O R L D C A P I T A L F E E A R N I N G S P A R E P L U S

## SALES & SERVICE

## Flying Farmers Plan Air Research

Convention discusses organization to study problems of aerial seeding, test and weed control.

By Alexander McSwain

**COLUMBUS**—Plans for a national research organization to develop approved techniques for residue spraying and dusting of farmlands are in formative stage, following the recent meeting here at the National Flying Farmers Association.

Full support from Indian scientists and agricultural agencies for the symposium was indicated at the meeting by Hites W. Ranawat, CAA administrator, who proposed a postgraduate clinic of arid and semi-arid districts to continue the research and health-related work. Baise Saha (senior research scientist) designed the symposium for agricultural needs. Studies of chemicals to be used for deserting and spraying, weed control, etc. Further discussion by members of the association developed tentative plans to hold such a clinic within the next few months, probably at a large agricultural college in the Midwest.

New Orleans — Jeffrey Watson, Thomas Olson, was selected president, and Bert Haines, Versant Chemicals, was elected vice president. Charles Mann, was elected treasurer. Clifford Rose, of Stensel, Ark., was named president. Theo Grahm, of Oklahoma A & M College, Stillwater, Okla., contrasted an executive secretary. Robert Kenneth Alford Wood, Alameda, Calif., named, although vice president.

■ **Admission:** Registration, \$100; speakers, \$150. Physical examinations were administered. Physical examinations were administered that advanced in medicine and spraying chemicals in the field.

poster years merited thorough examinations of large metal sulfonate tanks, aqueous and problems resulting from spraying and poisoning. Series and national regulatory problems resulting from aqueous use of spraying chemicals, such as the 240 word label which has caused damage to other crops when improperly used, and other factors to be

It is believed however that the rapidly growing large scale use of seed coating, weed control and pest control will result in a substantial increase in the total national agricultural productivity. Extent of its effectiveness may be determined largely by the bulk spread of cooperative effort in the country.

years among the farmers, avian and agricultural specialists, and government agencies concerned.

**\* Wooster Demonstrations—Nearly 300** Flying Flame plants from a wide cross-section of the United States landed a Don Scott report for the Columbus meeting held at Ohio State University. Many of the flying flames flew from Columbus to the nation's capital, spent most of time at Wooster, Ohio, for demonstrations of activities there, and then returned via Cleveland to the National Air Races.

Dwaine Wallace, president of Cross Aircraft Co., Wadsworth, who flew to the meeting in his own Cessna 190 five place airplane, pointed out to the group that he has flown approximately 13,000 miles on business trips annually, in his own plane, as an example of the useful transportation provided by the family size aircraft. Presenting the Flying Farmer in the use of the plane as a means of communication

chemistry is as keeping with his continuing philosophy of using new mechanical equipment as fast as it becomes practical, Walker told the group.

• **Airlines and Fares**—Robert Rappaport, executive vice president of Air Transport Association, discussed problems of scheduled airlines with the forum, pointing out the continuing obstacle to all forms of air travel inherent in conflicting and overlapping state regulations. He urged the importance of keeping state regulations at a minimum and keeping them uniform to avoid interference with national transportation which causes state leaders to react in a few hours.

William Anderson, Pennsylvania state assemblies director, reported that state aviation officials are making a united effort to keep state regulations down to a workable level, and as uniform as possible to prevent confusion with interstate air travel. He cited accident investigation and safety programs conducted in his own and other states as a sample of effective regulatory work which states are doing.

Growth of the Flying Forces of gameness in the last year serves as an important indication of the consensus groups' future influence on aviation. From 1300 members a year ago, the membership has now grown to 6700 and the growth is continuing. Active membership is limited to persons who make 50 percent or more of their income as sport pilots and who have at least a student pilot license. However,



PLAQUE AWARDED SEP. MILLER

Rep. William J. Miller (R. Conn.), who was active in the recent Congressional fight to preserve GI Bill training, received the first annual award of the Connecticut Amateur Trades Association at luncheon at Groton recently. Shows in

A large percentage of the members own their own plane.

■ **Not GI Training**—Wright of the Flying Farmers was thrown into one box a questioning effort to save a portion of the GI flight training program from the clutches of the Vietnam Administration to demonstrate it is more status. The farmers adopted a resolution pointing out that the airplane is becoming increasingly useful as an agricultural and business implement and asking that flying farmer groups be given their preference with Congressional delegations for aid establishment of a free national VA policy which will impact rather than contravert the intent of Congress to enable veterans who wish to use the airplane in their occupation to lease to it.

President Watson urged that the Flying Farmers establish an advisory committee of representatives of other aviation interests who would form a pool of their respective backgrounds to guide the association, and pointed out that the association as a consumer group not serving any particular interest had a good potential field of service to all aviation in such an activity.

■ **Covered**—The Flying Farmers report their opening day at Don Scott airport watching a series of aviation demonstrations, including Goodyear engines and landing gear, controlled model planes, air to ground radio communication at the Ohio state highway police between a state police car at the airport and the police. Becht Blumstein which was checked traffic, the owners have a die cast demonstration of a four blade Semanick fuel pump propeller designed for quick plane operation, a Bell helicopter from Wright Field, and Air Rescue flight demonstrations.

Study of the individual members attending the national meeting indicated that the farmers as a group are well provided, the best equipped market for bank and personal aircraft. But none of those attending flew similar planes. Typical was the attendance of whole farm families, including husband, wife, and children, in some cases all parents.

In one the group came from 35-year-old Stan Nelson, Colorado farmer and P-51 pilot, down to a six-week-old Ohio farm complex baby daughter, brought with the family plane and brought along to the convention.

#### Close Midland Field

Midland's downtown meeting, Most Field, has been closed until Nov. 1 because of the \$205,000 construction progress under way. John A. Hensley, president of Midland's Midland Inc., operator of the field and the construction work would cover a large part of the field making flight operations possible.

#### BRIEFING FOR DEALERS & DISTRIBUTORS

**AIRCRAFT SHOW**—Next thing to a representative showing of new 1948 personal aircraft that we've seen this year was the collection of planes on exhibit at Don Scott Field, Ohio State University's airport at Columbus, during the recent Flying Farmers meeting. The show differed from most of its kind, in that the people looking at the airplanes were actual airplane customers. Most of them had come into that airport on their own planes, including quite a few 1948 models.

**FOUR-PLANE COMPARISON**—Planes on display included virtually every American four-plane now on the market. From the Piper J-40, Cessna's lowest priced four-plane to the big Cessna 441—highest priced plane—this made a graphic demonstration of the increasing competition that the four-plane market is going to head-on aircraft which can be used equally well to run cargo. The new Piper, an Aerostar Sedan, and a complete line of Cessna planes, were brought to the field by dealers and manufacturers. But most of the approximately 380 airplanes were flown in by the farmers themselves.

**GRADUATION PROCESS**—A process of graduating from the low-powered four-planes to larger and more powerful planes seems to be taking place with some of the farmers. We talked to Al Ward, a Columbus farmer, who now has a Cessna 195 (4-cylinder) and also a Cessna 470 (14-cylinder). He finds plenty of use for both of them. He recently traded in his Cessna 140 two-place to buy the 170. Robert Watson, the Flying Farmers national president, has graduated from the Aerostar to be used by a light-powered Swift 125, and so it goes.

**ERCOUPE TESTIMONIAL**—Presence of 35-year-old Stan Nelson at the Columbus gathering was in itself a remarkable testimonial to the Ecoupe. The oldest flying farmer has been flying as long as 19 years, and flew from his Colorado home to Columbus in his own plane. The last we heard he was discussing with Joe Redding, executive vice manager for Sanders Aviation (and Ecoupe distributor) in order to buy his older model and bigger, the new 1948 airplane, No. 1000 of which Joe had brought to the meeting. Nelson says it takes him an hour and a half to get up to the altitude of the mountains surrounding his home. He has to go to about 14,000 ft. to get over them. "But after that," he adds, "it's a relaxing slide to the plane in the United States I want to go." The elderly pilot's income is through the Redding for many years until he was retired, and then took up flying the Ecoupe instead. Even before he went to introducing he had done plenty of another sort, as the old Cherokee told, landing cattle up to Dodge City.

**CROSSWIND GEAR INTEREST**—The flying farmers with their single attention landing stages are natural customers for the new faughed covered landing gear, and they showed keen interest in demonstrations of the landing gear at Columbus. Art Chapman, Goodyear demonstration pilot, told us that Cessna's first order for 100 sets of the Goodyear covered wheels was already orders for its customers who want it as optional extra cost on their Cessnas.

**FOUR-BLADE DEMONSTRATION**—A light demonstration of a four-blade fuel-pump Semanick propeller on a Cessna 140 emphasized the virtues of this type of propeller. It probably the best use of its kind and before a group of potential customers. The demonstration had only one small flaw, and the engine turned at normal cruising rpm. Yet even so, the noise level was down appreciably below that of other planes. A sacrifice in rate of climb in the four-blade is something which would be hard for most farm fliers to take, but the advantage of quieter air is just partially offset by this disadvantage.

**ERCOUPE CROSS COUNTRY**—A flight from Washington, D. C., to Columbus in the 1900B Ecoupe, with Joe Redding as pilot, gave to the writer another indication of low power and small plane cross-country flying can be under ideal conditions. The flight was made in somewhat less than four hours elapsed time with a 20 minute stop at Cincinnati, Pa., included. The writer trimmed out nicely and Redding actually flew "his lander" a good part of the way.

—ALEXANDER M'GUREY

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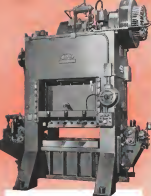
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## AIR TRANSPORT

### Airlines Backstop Berlin Airlift

Massed contribution heaviest thus far as carriers fly priority supplies and personnel to Germany.

The U. S. air transport industry, which has been given a vital role in bolstering American military supplies to Europe, is preparing to play an even more critical assignment.

Both certified and uncertified lines during most of the season have participated in the Berlin Airlift. The conventional carrier's first job—taken over soon after the Berlin blockade was imposed—involved transportation of spare parts from Western Europe. Most of the airlift, however, has been U. S.-operated in Operation Vittles.

**► Lift Expands**—This movement has continued and expanded. More recently the airlines have helped supply the five 3,200 gross lb. in England and have facilitated transportation back to the U. S. of military dependents and civilian personnel stationed in the American zone of Germany.

Meanwhile, the committee reported last March by the Air Transport Association to study plans for allowing the certified airlines to use all national emergency has had several meetings. A plan for continued operation of the regular carriers during a crisis, together with proposed allocation of aircraft, was submitted to the commander of the Military Air Transport Service last April.

The final step has not yet been decided. When it is, ATAA's legal subcommittee will work with MATS to develop implementing contracts.

**► All Facilities Offered**—Several uncertified carriers have offered their entire facilities to the military. To date, the contribution of the more flexible noncertified and contract companies in the European supply has been overshadowed that of the certified operators.

In the first movement of 62 tons of military material into Frankfurt last July, irregular carriers made an flights against those for the regular U. S. flag lines curtailed over the North Atlantic. In the second lift, involving 108 tons of cargo, the uncertified carriers made 14 flights against two for the flag line.

These irregular carriers—Swireland & Western Airline, Alaska Airlines and

Transwestern Air Lines—had the necessary long-range capabilities available when MATS found itself unable to handle its suddenly-increased loads. American Overseas Airlines, TWA and Pan American Airways had a lower amount of long-range flight capacity available at that time.

**► Increase Cuts**—During the first three weeks of July, Swireland & Western's C-54s made ten flights from Western Field in Frankfurt carrying 144,702 lb. of cargo—an average of 14,470 lb. per flight. In the same period, the uncertified airlines' five flights averaged 104,610 lb., or 12,076 lb. per flight.

Through Sept. 6, Swireland and



LANDING AIDS CHIEF

With several of its contract to operate the Landing Aids Equipment Station at Aachen, Calif., Transwestern Air Lines recently moved to Alaska. A. Gifford (above) is technical director of the project. Dr. Gifford has conducted extensive research with airplanes, both in a dragster and windtunnel, and during several years' association as technical instructor with major U. S. airlines he made studies of upper atmosphere conditions. Transwestern has been contract operator of the Air Force Navy-CNA Air Transport Association project at Aachen since January, 1945. In addition to assisting the facility, Transwestern's contract services include maintenance and flight testing of the landing aids.

Western had flown 411,554 lb. from the U. S. to Frankfurt and 282,018 lb. from Germany back to the U. S. Between military cargo flights, Swireland is used in the Frankfurt-Berlin shuttle, carrying 745,827 lb. in loaded shipments to units consisted of foodstuffs, while otherland loads are made up of manufactured or partly manufactured items for the American zone of Germany.

Altogether, the three principal irregular carriers participating in the MATS airlift have flown about 15 C-54s in the Atlantic zone. While not engaged in the military lift these activities have been intensively varied.

**► Other Activity**—Swireland & Western's C-54s are engaged in commercial cargo service to Europe on an irregular basis. But they have also made a number of special trips for government agencies.

Transwestern Air Lines, which operates from New York to Chicago in the Atlantic zone, also is flying occasionally in the MATS airlift. Besides flying between the U. S. and Frankfurt with national to implement Operation Vittles, TWA has been flying several trips into Berlin with GCA equipment and other supplies.

A major TWA operation in the carrying out of this year's contract with the International Refugee Organization is to fly around 25,000 displaced persons to Venezuela. Flights are made via Caracas, Newfoundland, and Bendley Field, Windsor Locks, Conn.

**► Flights to Alaska**—Transwestern's Alaska Airlines, which is active for the Helms International Aid Society and has done considerable work for the United Nations and State Department in the Pacific, TWA has been carrying shipments between Seattle and eastern Alaska and has been flying from Oakland, Calif., to Guam and Germany for the Corps of Engineers.

Alaska Airlines, which is certified in Alaska, has had about four C-54s in the Atlantic zone. Besides its military work, it has been active in the Seattle-Alaska run on a non-certified basis and has made flights to all parts of the world.

**► Berlin Supply Link**—American Overseas Airlines during August has 11,000 employees and aircraft 2,000,000 lb. of freight between Westfield, Berlin and Frankfurt. These operations were in addition to general cargo flights between the U. S. and Frankfurt and regularly-scheduled westbound passenger trips from Germany carrying soldiers' dependents and civilian personnel who had been taken into custody in the American zone of Germany.

The only American flag carrier operating into Berlin on a regular schedule, ACA made 192 flights over the Frankfurt-Berlin air corridor in August. GCA carried on the run by American





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## Freight Route Fight Enders Last Rounds

One of the final rounds in the long  
fight by all-cargo carriers for certification  
took place last week when the Civil  
Aeronautics Board heard oral arguments  
in the Air Freight Route Case.

Six of the applicants in the proceeding  
were represented for three-day  
hearings by CAB members: Earl  
Merk. They are: **Shick Airways**, Cal-  
ifornia Eastern Airways, the Flying  
Tiger Line, U. S. Airways, Wells Air  
Service and American, Inc. Eleven de-  
scribe themselves and the Air Trans-  
port Association as holding the estab-  
lishment of certified all-cargo opera-  
tions.

► **Recreation Seven-ATA**, is a new bid  
to CAB, asked the Board to consider  
whether there is not already too much  
competition in the industry. It de-  
clared that the critical financial condi-  
tion of presently-certificated lines and  
the prospect of a recession in general  
business activity in the air-to-land  
freight route certification, all-cargo  
routes a "natural disaster."

The Association pointed out that the  
all-cargo lines recommended for au-  
thorization by the carriers had paid ap-  
prox. \$15,000,000 in deficits  
through last May 31. It noted that it  
seemed unlikely that forced some of  
the all-cargo applicants to start or sus-  
tain operations solely although they  
have had scheduled common carrier  
operations for miles than a year before  
the merger.

► **Reply Issued-Shick Airways**, largest of  
the all-cargo carriers, replied in its  
brief to CAB that the certification pro-  
cess has been consistently taken a  
negative approach to freight develop-  
ment. Shick charged that the certificated  
carriers, with the aid of government  
subsidies, have constrained their ef-  
forts to effect heavy losses in freight  
operation and drive them out of busi-  
ness.

The Shick brief requested that the  
first freight brief filed by a passenger  
carrier did not become effective until  
October, 1946. It pointed out that un-  
certificated operators have handled the  
bulk of all air freight during most of  
the postwar period.

► **At Air Cargo, Inc.**, **Rolling-Morse**, CAB  
has indicated its belief that Air  
Cargo, Inc., the regular aircraft ground  
service department, must submit to  
membership any holder of a certificate  
of public convenience and necessity.  
Eastern Air Lines and United Air Lines  
had argued that this condition drives  
users against the regular and present  
owners of Air Cargo, Inc., who have  
spent considerable time and money in  
developing its operations.

The Board replied that any such in-

dustry-wide setup at Air Cargo, Inc.,  
must admit all carriers holding a certi-  
ficate as the public interest will be af-  
fected and the development of uncer-  
tified activities retarded. Then, if all  
cargo carriers are certificated, they may  
obtain membership in Air Cargo, Inc.,  
as a matter of right.

## Crash Report

**CAB report blames EAL  
crackup on failure to  
maintain safe altitude.**

The cause of the crash to follow pre-  
scribed instrument procedure and to  
maintain a safe altitude during an in-  
strument approach to Washington Na-  
tional Airport probably caused the  
crash of an Eastern Air Lines DC-1  
near Goose Hill, Md., last Jan. 13, ac-  
cording to a Civil Aeronautics Board  
accident report.

Based from Atlanta in Washington,  
the plane struck two tops about 3 1/2  
miles south of the field while in level  
flight and on line with a runway and  
ILS localizer. Five of the nine co-  
pilots, including the pilot and co-  
pilot, were killed. Five were injured.

► **Poor Weather**—Weather conditions  
around Washington at the time of the

accident were poor, ceiling ranging  
from 100 to 200 ft. Visibility was re-  
stricted to four miles and there was  
light rain and fog.

CAB found no evidence of structural  
failure or mechanical malfunctioning  
on the DC-1 prior to the crash. The  
airplane apparently was in normal  
working order, and there was little pos-  
sibility of wing wing. When the plane  
hit the tops, landing gear was down  
and flaps were up.

► **Flare Below Minimum**—Prescribed  
Eastern Air Lines procedure for an ILS  
approach to Washington National re-  
quires a flight to maintain a minimum  
altitude of 1500 ft until over the en-  
route fix, then descend within 5.2 miles  
south of the airport. When the plane  
hit the tops, it was only 106 ft above  
sea level instead of the prescribed mini-  
mum of 1500 ft.

The accident investigation indicated  
that the plane must have been below  
the 1500-ft. minimum for some time  
before the crash. Washington Na-  
tional's radar scope was unable to  
pick up the DC-1 prior to the crash,  
although it approached within 5 1/2 miles  
of the field. The crash beam flying  
at the prescribed 1500-ft. minimum, it  
almost certainly would have been dis-  
coverable by radar when it passed over  
Mt. Vernon, which is located near  
Washington.




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American-built aircraft have achieved outstanding supremacy as the world's airways during the postwar period.

In last April, foreign carriers were flying 71 percent of their scheduled phase miles with planes manufactured in the U. S. Only 18 percent of the foreign operations were equipped with non-U. S. equipment, while 11 percent of the services could not be analyzed specifically by CAB's Economic Division, which made the study.

With all U. S. airlines using planes of domestic manufacture, the proportion of world air carrier operations under the U. S. flag conducted with American planes reached 67 percent last spring. Non-U. S. aircraft are used for about 5 percent of all services, and the remaining 5 percent could not be classified.

Services increase—Aided by three American-built planes, foreign operators are accounting for a steadily increasing portion of total miles flown each week by all air carriers. Of 1,945,800 scheduled phase miles flown weekly in

March, 1946, foreign built totals of 66,000 miles, or 34 percent, constituted U. S. international lines, 903,000, or 11 percent, and continental U. S. domestic lines, 4,947,800, or 51 percent.

The U. S. share of world-wide aviation decreased from 66 percent early in 1946 to 61 percent in April, 1947, and 54 percent in April, 1948. The trend can be accounted for almost entirely by the leveling off of U. S. domestic operations.

From 4,947,800 scheduled phase miles weekly in March, 1946, U. S. domestic carriers increased services to 4,515,000 phase miles weekly in April, 1947, but did not reach 4,093,000 in April, 1948. By contrast, U. S. inter-continental operations expanded from 961,106 scheduled phase miles weekly in March, 1946, to 1,472,800 in April, 1947, and 1,738,800 in April, 1948. Meanwhile, foreign services more than doubled in the two-year period, rising from 1,037,000 scheduled phase miles weekly in March, 1946, to 4,377,000 in April, 1947, and 6,189,800 in April, 1948.

Route mileage growth—Unpublished route miles flown by the world's airlines jumped from 471,000 in March, 1946, to 791,000 in April, 1947, and 947,000 in April, 1948. During this period, continental U. S. domestic route mileage rose from 46,000 to 66,000 U. S. operational mileage from 45,800 to 65,000, and foreign mileage rose 177,000 to 258,000.

CAB reported the existence of 226 scheduled common carrier airlines in April, 1948, against 157 a year before and 143 in the spring of 1946. Of the 226 airlines, 177 are foreign carriers and 49 are U. S. certified airlines including 15 Alaska operators.

Largest carriers listed—The world's ten largest airlines from the standpoint of scheduled phase miles flown per week in April, 1948, were TWA's 1,268,930, Pan American Airlines 1,185,371, United Air Lines 1,067,618, Eastern Air Lines 823,347, American Airlines 752,641, British Overseas Airways Corp. 574,096, KLM 485,768, Air France 376,698, Northwest Air Lines 367,139, and Capital Airlines 300,331.

First six entries on the basis of un-duplicated route miles were Air France 66,296, KLM 54,970, BOAC 54,440, Pan American 52,075, Sabena 27,571, and Panair de Bresil 16,020.

### Landing Passes Bar

James M. Landis, former chairman of the Civil Aeronautics Board and now dean of the Harvard Law School, has today and passed his first examination.

## On-Time Pays

Airlines step up efforts  
to fly on schedule. Result:  
fly: goodwill.

The airlines are joining their efforts that clock-work and passenger-good will go hand-in-hand.

During the past year, on-time performance has been emphasized by most agencies in an unopposed degree. Results in many cases have been impressive, with most of the accounting done not attributable to better weather, but to careful control of weather and air traffic conditions.

NWA's Relaxed Disruptions—Northwest Airlines, the only carrier which has made itself ready to passengers because of delays, dropped the practice early this month but is continuing its drive for increased schedule dependability. The carrier on May 15 began making 5 percent late flights in passenger service at their destination more than 36 minutes late. Less than 10 percent of NWA's flights were delayed more than half an hour during the 1948 period; the record point was effective.

TWA usually attacked such tactics with its on-time contest among domestic stations that it has stated similar competition on its overseas routes. During July, TWA's domestic flights completed 99.4 percent of their scheduled mileage, and the carrier's four-stage bonus (Statistical and Compensation) averaged only 9.4 cents late at final destination. This represents a 50 percent improvement over time and in 51 percent gain over August, 1947.

Continental flights alone averaged a full cent minutes late at final destinations during July. DC-3 passenger flights averaged 23 minutes late during the month, a 16 percent improvement over June and a 47 percent improvement over August, 1947.

On Delay Counts—TWA's occupation of all four stages covered every delay of more than one minute, regardless of cause. On issue of the carrier's short-haul DC-3 flights, as many as 16 steps are made in trials, with a limited ground time for loading and unloading passengers, mail, cargo and baggage.

United Air Lines reports that between March and July it showed a 28 percent gain in the percentage of flights commencing within 15 minutes of the scheduled time. In July, UAL operated almost 95 percent of its scheduled trips from point of origin, almost 94 percent departed within 15 minutes of scheduled time; over 95 percent were operated through to their terminal points.

and over 72 percent arrived at terminal points within 15 minutes of scheduled time.

Benefit Airways' expansion vice president, Charles E. Benef, states that his company's flight delays have been reduced 75 percent since last November, when all divisions of the line were mobilized to tackle the problem of schedule dependability. Ninety percent of Benef's trips now leave within 10 minutes of the scheduled departure time.

Personnel Caseloads Contained—Streamlining of terminal operations, both in loading of passengers and in servicing of planes, purchase of type suited equipment, and selection and retraining of personnel are the principal methods by which Benef has improved his time performance. The carrier has established a personnel on-time committee whose function is to track down every unsatisfactory delay on both domestic and international flights and take steps to prevent a recurrence by changing operational procedures, purchasing new equipment, or hiring or firing personnel.

Continental Air Lines' program to step up ground handling efficiency as reflected in a 46.9 percent reduction in flight delays during the first seven months of 1948 compared to the same period last year. Between April 1 and July 31, Continental completed 100 percent of its scheduled flights.

## Tucson Field Redies For Airline Traffic

Tucson Municipal Airport, Arizona government built an area south of the city of Tucson, Ariz., will be opened to commercial traffic Oct. 15.

R. W. F. Schmitt has assigned his position as superintendent of airports to the Civil Aeronautics Administration, Report No. 1, to become superintendent of the Tucson field.

The newly created municipal field has been leased from the government for 25 years plus a renewal option of 25 years. It has two 6,000-ft. runways, one 4,000-ft., administration buildings, and three hangars, each 750 ft. in length with a span of 360 ft.

AA to Move In—American Airlines, only carrier now landing at Tucson, will move operations to the new field upon its opening. Braniff, Eastern, and Alamo Naves want to base operations if CAB approves applications to enter Tucson.

Utmost respect of the new municipal field is that it was made possible by the bonding together of 15 Tucson businessmen as "Tucson Airport Authority." The authority is empowered to meet its operating costs on a 4 percent debenture basis. Business forecasts in Tucson that control building savings, results will be required no longer than through 1946, and that by the spring of 1950 the airport will be paying its costs.



### FLIGHT SIMULATOR PREVIEWED

Pan American Airways last delivery the new, the DeHavilland electronic flight simulator it will use to train crew on Stratosphere, day, December the device on Reg. Gen. Cad. Reg., military expense.

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### Comparative Transportation Safety Record

Passenger Fatalities and Rate of Passenger Fatalities per 100,000,000 Passenger Miles

	1941	1942	1943	1944	1945	1946	1947
Passenger automobiles and taxicabs	•	•	•	•	12,000	15,400	18,300
Rate	4.0	2.7	2.7	2.9	2.5	2.5	2.1
Plane	•	•	•	•	120	140	140
Rate	24	21	22	22	27	19	21
Railroad passenger	30	110	262	240	141	135	79
Rate	14	17	11	16	16	16	14
Domestic scheduled air transport planes	37	35	22	48	56	35	198
Rate	2.31	2.31	1.34	2.12	2.25	1.21	1.21
International scheduled air transport planes	2	4	10	17	17	40	78
Rate	1.04	0	5.51	4.83	5.67	1.54	1.08

\* No accidents

### High Safety Record Seen for 1948

Eight-month showing by domestic carriers well under 1947 fatality record; year may be one of best.

U. S. air carriers completed the first eight months of 1948 with high hopes that this year will be one of the best in history from a safety standpoint.

Despite the crash of a Northwest Airlines Martin 24-1 at Wisconsin Dells, on Aug. 22, the domestic carriers had only about 24 fatalities per 100 and low passenger miles flown through Sept. 1. For all last year, the domestic fatality rate was 2.21 per 100 million revenue passenger miles.

**Accidents Listed**—During the first eight months of 1948, 151 passengers were killed on domestic airlines as a result of three DC-4 accidents and one DC-3 mishap. In the same period this year, 34 passengers were killed on the scheduled domestic lines.

Besides the recent Northwest Airlines mishap, in which three crewmen and 34 passengers died, the following fatal domestic crashes have occurred this year: Jan. 15, Ocean Hill, Md., Eastern DC-3, two crew and three passenger deaths; Feb. 7, Russell, Pa., Eastern Constellation, one crew death; Mar. 10, Chicago, Ill., Delta DC-4, four crew and eight passenger deaths; June 17, Mt. Carmel, Pa., United DC-6, four crew and 39 passenger fatalities.

**Domestic Operations Extraneously**, U. S. flag carriers had only one fatal accident during the first eight months of this year in scheduled operations—the crash of a Pan American Airways Constellation at Shannon, Ireland, on Apr. 15, with ten crew and 30 passengers killed. In the same period last year there were two fatal accidents with

eight crewmen and seven passengers killed. Fatality rate of U. S. flag carriers for all last year was about 1.08 per 100 million passenger miles against about 1.8 during the first eight months of this year.

### Freight Forwarders Win 5-year Tenure

Freight forwarders have won their fight for a place in the fast-growing air cargo field.

Despite strenuous opposition from the certificated airlines, the Civil Aeronautics Board has adopted new regulations and issued an exemption permitting the forwarders to function as indirect cargo carriers for a period not to exceed five years. Adversely that an exemption is limited on incomplete data, CAB decided that the need for air freight forwarders has been sufficiently established to justify their operation for a limited period during which complete experience can be developed, permitting determination of a sound permanent policy.

**Authority Granted**—The Board authorized issuance of 75 letters of authorization to forwarders, some of whom have operated in the past with doubtful legality on a "contract" basis or as "shoppers" agents. No forwarders have been placed on the number of air-freight forwarders who may qualify for letters of authorization as against the number of points between which the indirect carriers may render service.



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...and all the rest of this big tribe of metal work binders and attachments—designed to save you quickly and easily in hundreds of places. As handhelpers, they're worth their weight in silver as time-savers, they're money in your pocket.

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When you're looking for a self-locking nut built to resist high temperatures and corrosion, don't overlook SOL-A-NUT. This reliable fastener has already proved its status in many hot spots — as exhaust systems, pre-heaters, turbojet superchargers, jet engines and the like.

Scalpy, one-piece mild-steel construction resists long life — it will not corrode during flame-outs in use — quick and easy to install. SOL-A-NUT meets U.S. Government standards.

Monadnock also manufactures SNAP-IT-TRIM and FARRHOG fabric and insulation treatment, Adco-Rite WELDITS, AIRLOCK ... but a wealth of experience in the fastening field. We welcome inquiries from manufacturers seeking reliable development and production facilities.



a subsidiary of UNITED-CARB FASTENING CORP.

Uncertificated airlines, shippers and cargo owners had lacked satisfaction or exception at the forwarders, stating that they would generate additional business and facilitate movement of cargo.

Forwarders arrange pickup and delivery, consolidate mail shipments into placeload lots, and take full responsibility for the cargo movement from point of its acquisition to final point of its destination.

**Railway Express Status—Controversial** with the freight forwarder dream, CAB decided that it would continue to effect the exemption which permits Railway Express Agency to engage in air express operations in an indirect carrier under contracts with the certificated airlines. The board found it to be in the public interest that air express remains a separate expedited service, differing in essential details from air freight.

But Railway Express was ordered to negotiate new contracts with the certificated carriers. CAB refused to give REX a permanent certificate as a condition of exemption, deeming it satisfactory to engage in air express services over noncertificated airlines; and deferred final action on the company's request to handle and process overnight mail act as an air freight forwarder for air transportation.

## Honolulu Route Contested

For American Airways to add the Civil Aeronautics Board to stop the Seattle-Honolulu route remains recently granted Northwest Airlines, pending rehearing and reconsideration.

Changing that the decision was not legally affecting, PAA pointed out that only one member of CAB who voted for the award in March was still with the board at the time the President approved the option late in July. For American also declared that it can operate the Seattle-Honolulu route at a subsidy cost \$37 per passenger lower than Northwest and can compete more effectively with foreign flag operators in the Pacific.

## Mexican Troubles

U. S. efforts to negotiate a bilateral air transport agreement with Mexico have again been suspended.

Failure to sign a 1961 despite commissions by both sides acts back further the date when Boeing Airways, Western Air Lines and Eastern Air Lines will be permitted to activate routes to Mexico that were prohibited in CAA's latest American decision in the spring of 1946. U. S. and Mexico reached a joint statement expressing hope that an acceptable agreement may be reached in 1962.

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# The Birdmen's Perch

by Major Al Williams, ALIAS, "TATTERED WING TIPS."

Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 20, Pa.



**Goodness!** The Little Known Facts Dept. is officially reopened!

(We closed up temporarily while we awaited Gulfplane Aviation—cleared D — the world's finest oil for horizontally opposed aircraft engines.)

We're going to be able to take things, and monopolize the department with our own "Fact!" this month.

We got a new Gulfhawk, you see. Naturally, we want to tell you all about it and then you get it. (Wouldn't you?)

Well, close the lid, in honor of the old

Gulfhawk. She's a Genuine P-1, and so help us! She'll pump up to 16,000 feet in 100 seconds from the clouds! We can get 2000 hp out of her with water injection, which is almost enough to get from here to there before we leave her!

With all that horsepower, the Navy version can get off a light deck in practically one wind. And next you, we installed 2500 lbs. of cement boots on our ship. Imagine what ours will do!

We can't tell you a whole lot about her yet because we haven't really had a chance

to get acquainted with her. But as we get more time in her, we'll keep you posted.

Meanwhile, what all you know about the Little Known Facts Dept. is, hope, is a name that you can count on. And "Fact!" is again. Some words: Commission to Perch Pilot (Personnel) for a person "Fact". . . Senior Perch Pilot's rating for "Fact". . . and Command rating for "Fact".

(And don't forget our new Gulf Hawk Aviation—Series D is horizontally opposed engine.)





## Can you name all three?

They're Boeings—built by the pioneer in manufacture of transport airplane and commercial aircraft—members of the same family as the B-17 Flying Fortress and B-29 Superfortress.

At bottom, you see the Boeing 214 transport Clipper. Just above it flies the Boeing Stearman. And at top is the newest of the three, the twin deck Boeing Stearman.

Custom of presidents and great nations, Pan American's steam-heated

214 Clippers and their sister ships fly big. British Overseas Airways alone transported 135,999 passengers, 10,709,000 pounds of mail and 10,241,000 pounds of cargo over 30,357,000 miles of flight routes to Europe and Asia. And now under new ownership they're still flying!

The Stearman, built by Boeing in 1939 and "drafted" in 1941, virtually blew itself for the Army's Air Transport Command. They made 3000

wartime ocean crossings and flew 7,500,000 miles without mishap. That was the first transport with pressurized cabin.

New comes the great Boeing Stearman. This two-deck luxury liner combines the ruggedness, dependability and streamlines of her predecessors with suitable speed, comfort and spaciousness. Stearman has been ordered by six of the world's leading airlines in queues of three or four.

**BOEING**

Boeing is building lines of Stearman for fast forward deliveries:  
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For the 214, the B-29 Superfortress, B-29 Stearman and B-29 Stearman: see the Boeing, the B-29 Stearman.

## Fear Still Prevents Many From Flying

Fate of flying is still posing a serious deterrent to the expansion of commercial air transportation.

A recent consumer survey by the St. Paul, Minn., Dispatch-Herald Press shows that 70.6 percent of the persons objecting to plane travel do so because they consider it unsafe. Another 18.8 percent say air transportation is too expensive, and 4.6 percent find flying unpleasant.

Other reasons—more reasons for avoiding the various health considerations, 1.4 percent; employment by companies engaged in a competitive type of transportation, 1.9 percent; and unsatisfactory schedules because of weather conditions, 1 percent.

Of 105,126 persons participating in the consumer analysis of the St. Paul Herald, 80,913, or 77.2 percent, and they were not commercial airline travelers, and 20,777, or 7.8 percent, said they were. Of all consumers paying \$50 or more monthly rent, 12.6 percent said the airlines.

## Alaska Airlines Enjoyed

Third division ticket cost for the territory of Alaska has gained a prominent reputation to attract Alaska Air-

lines from engaging in services for transportation otherwise than as provided by the Civil Aeronautics Board. Action was brought by Pacific Northern Airlines, holder of a certificate between Anchorage, Kodiak, Nukun and Juneau, when it contacts with Pan American Airways' link to Seattle.

## CAB SCHEDULE

Aug. 22—Starting on cab's introduction of Chubb's airline, various airlines have been scheduled.

Aug. 23—Starting on Chubb's airline, various airlines have been scheduled.

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Aug. 50—Starting on Chubb's airline, various airlines have been scheduled.

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**exchange policy:** The Steward-Davis R-1830-92 Conversion is now available for \$1665 with the exchange return to Steward-Davis of a credit run-out R-1830-92, complete with carburetor, magnetos and ignition harness. Freight charges for the return of this engine will be paid by Steward-Davis.

On October 1st, 1948, the cash price of the Steward-Davis R-1830-92 Conversion will drop one hundred dollars. This reduction in price will be based on the return to us at our expense of a run-out R-1830-92 engine.

What will this mean to you as an operator? This policy will slash the price of the Steward-Davis R-1830-92 Conversion by one hundred dollars every time you purchase after October 1, 1948. This will be particularly important to you if your operations are outside the United States in an area where dollar credits are difficult to arrange. This will mean that the possibilities for direct savings of your capital are great, for not only will you save one hundred dollars each time you purchase an engine, but these savings will continue to compound as you repeat your orders. At the twelfth purchase for instance, you will have earned twelve hundred dollars on the investment of but a single run-out engine.

Why have we instituted this program? Because we wish to be in direct contact with you as the actual operator of your flight operation so that our merchandising policy of performing a service may be distinguished from making a sale. Because we wish to show you how our co-operation can largely shoulder the engine procurement and overhaul problems which you find a prime factor in the operation of your business. To do this to our mutual profit and advantage we realize that such a plan must offer you an incentive in quality, service and savings which will make it wise and sensible for you to purchase all, or at least a major portion of your engines from us. We believe that the combination of this fine engine, this new lowered price and this exchange program are these incentives.



The Steward-Davis R-1830-92 Conversion, completely overhauled, warranted for 100-hours, run-in, prepared for long-time storage and packaged for shipment, is now immediately available from stock at WILLIS AIR SERVICE, INC., Teterboro Air Terminal, New Jersey; WESTCOAST AIRCRAFT, Boeing Field, Seattle; Washington and STEWARD-DAVIS, 13501 South Western, Gardena, California.





# EDITORIAL

## Air Fares Bounce Off the Ceiling

air transport has reached their peak between Sept. 1 and Sept. 15 then started falling, and had. The pattern is for airlines to raise fares, a condition in the program is underway.

Only 10 days after it there a 15 percent premium fare on the DC-6, United Air Lines announced it was dropping the extra charge on Sept. 15. That was the day American's new family fare went into effect. But that wasn't all. John Q. Public got another break. United decided to operate on a 15 percent reduction on its round trip tickets. American, which had refused to drop a premium on its 800, immediately met United's usual top reduction.

So the public gets it. It will also get from American's president using "family fare plus." This is already in progress. On one trip started Monday, Tuesday, or Wednesday one adult can buy a ticket at the regular rate and other members of the same family. Family may travel for only half fare. At least, a seat sold at reduction brings more revenue than one not sold at all.

Other significant decisions, already published, are Pan American's one second class tourist fare between the U. S. and Puerto Rico, and reduction of transatlantic fares Oct. 1.

Meanwhile the increasing demand for lower fares and fuel of record this season caused airlines last week here to state an intention to act independently in the Western Hemisphere. The director general of the International Air Transport Association, Sir William, in his annual report presented Sept. 14, says:

"The Traffic Committee has recognized that the time is not far off when the air transport industry will need to move into the field of second class fares, and has expressed the view that this development must take place on a basis which will get the airlines into a new balance."

As an outcome and precisely calculated passenger market has not yet been tapped because it cannot afford the present rate structure, and the Committee rightly feels that development of a better quality service for a lower fare is fundamental to the success of the industry. I hope we shall get vigorous endorsement action on this line if it is what business life."

Therefore we hope, Sir William says.

"What I have said applies to me in the attention that I give to the domestic situation. I do not think the airlines should ever would suggest that they offer as comfortable a service in the regular operation. They offer a pretty much stepped down service. I am all for the benefit of lowest competition and value to the public. A good restriction can be put on there is a price below which we cannot go because as the airline business with 65 passengers up to the air at 20,000 feet, no pricing down of expenditure on maintenance can be tolerated for a moment."

"The fact that these operators can find a ready market indicates that there is a growing public who wish to travel by air, and I have long felt that IATA members might consider, at the time will improve the different grades of service, stepped-down service in service, as well as service offering luxury and comfort. . . .

The airplane must first show to become the vehicle for the future. I believe, and I hope I shall have some of that thought coming into the conference and IATA members at this point as well."

American West could not expect its policy on the subject any more clearly than Sir William has outlined it above.

For American, it now develops, had hoped to operate second class fare line with Boeing Superliners. Its officials asked American West that "the sub-compelling incentive" on setting

a second class rate schedule has been equipment shortage. "The American line is the first to really relieve equipment shortage in the Latin American Division."

FAA reports the economic background of the new Puerto Rico service as follows:

"The program that year increased total passenger traffic, including the number of passengers, to 100,000 for the first seven months. This figure was broken down as it was of traffic."

"We believed in the need for stabilizing a sound air transport service which will be available to the class of traffic and on which they can rely for financial stability, schedule performance, and highest standard of safety."

"We then did two things. First, we tried to move it what we considered an equitable and fair rate which would make these people. In order to do this, we considered the Puerto Rico government, we considered with travel agents who were selling the lowest rate, of course, we increased the transportation."

"Secondly, we did this, we discussed, one within the pocketbook range of this new group. Second, we had to decide whether \$75 was an economically feasible rate. There were several areas of consideration. There was one FAA would not consider it would not judge on the operational standards. There, the highest in the industry, an incentive."

"By taking out the policy and the cost risk, FAA requires that they could accept the cost of the DC-4 be 30 percent, down 12 to 15. However, we had to get the fare down to \$75. Our present one way fare is \$119. Reducing it 20 percent is a direct result of adding 20 percent more seats would have brought the fare down only to about \$106. We had to look further. An additional expense that might be charged was meals and some of the other extras we normally provide in the lower fares, such as a bar and other amenities. We did not completely eliminate food service. We plan to schedule the plane to that it leaves New York late at night and arrives around breakfast time. We plan to serve a richmond breakfast, coffee, and other all-day bar as a discount meal. The result is a better meal."

"At the point, when we got acquainted with the \$75 round trip economy rate in the summer of 1947, we had to take a gamble. We had to assume that because of the rate we would carry more passengers per plane than on the house service, i.e., a 10 percent increase in load factor. Whereas, our regular service to Puerto Rico carries even a load factor of between 75 and 85 percent, so on this new tourist service we will have to have a load factor the percentage of between 65 and 75 percent."

"We believe we can achieve this last factor and to do so we will begin aggressively selling this new type of traffic. We plan to open a division of sales office, Longshore service will serve directly for La Guardia from there."

"At the point we are most confident. We are hopeful that the new will encourage further thought and action on the subject of lower fares in other parts of the world."

For American Airlines to take a chance. Instead of going to CAA or the courts to try to put an unscrutinized competition out of business, it takes the attitude that if the people want to fly at low rates it will give them the service, and let the last man win. We have not always agreed with FAA in the past, but it seems to us that American is involving the domestic industry in competitive issues. Instead of saying blindly that any traffic pattern costs they go not trying to improve it."

BENNETT R. WOOD

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